

Dental Digest

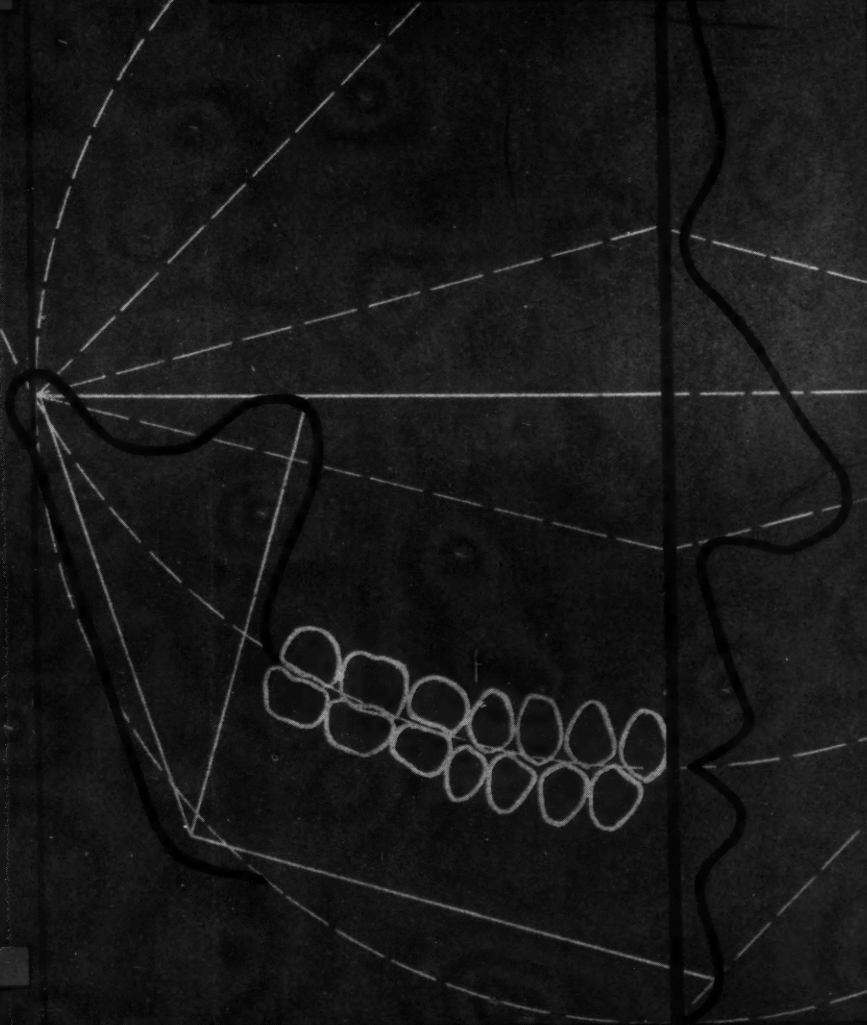
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FIVE-PHASE ANTERIORS

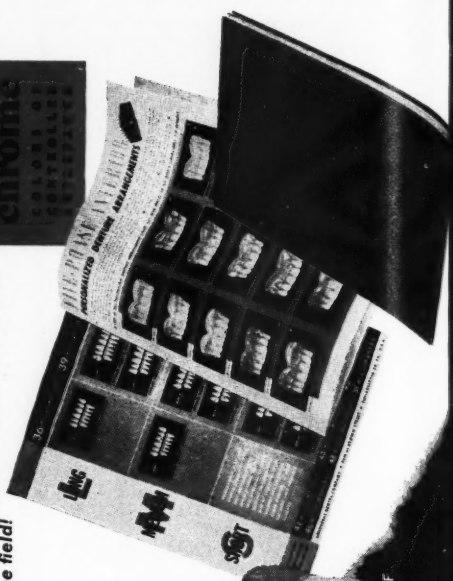
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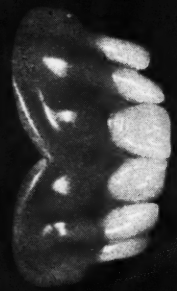
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PHILLIP M. CHERNOFF, D.D.S. (The Thomas W. Evans Dental Institute, University of Pennsylvania, 1922) presents the third installment of a four-part article, **SURGERY VS. BACTERIOLOGY IN PULPLESS TOOTH MANAGEMENT**. Step-by-step directions are given for procedure in root canal filling.

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JAW RELATIONS:

Their Significance and Importance in Denture Construction

HUGH G. MORAN, D.D.S., St. Louis

DIGEST

The importance of jaw relations in the construction of dentures and other types of restoration is demonstrated by the number and variety of methods employed to obtain and to transfer the mandibular-maxillary relation to the articulator. The objective of the numerous procedures is, of course, a satisfactory functional restoration that will be pleasing to the patient. This article discusses the basic theory underlying the nature of jaw relations and describes a method for restoring normal relationships by the use of instruments especially designed for this purpose.

General Considerations

An adequate comprehension of the subject of jaw relations is valuable, not only in completing dental restorations, but in the diagnosis and treatment of certain abnormal conditions of the temporomandibular articulation, the teeth, and their supporting structures. Disorders resulting from inefficient mastication, facial expressions of premature age, and conditions of tensility are caused or heightened by the continued annoyance of a malfunctioning dental mechanism.

Results of Investigation—In considering the subject of jaw relations it is necessary to examine associated structures and forces and, if possible, discover the factors by which they are governed.

Investigation has revealed facts concerning jaw relations which would seem to be of considerable significance. The conclusions of some in-

vestigators have been confirmed while the claims of others have been disproved. It is evident that the mandible in its normal functional position bears a definite relation to the maxilla and other integral bones of the cranium and face, as do other associated parts of the skeletal frame. Dentures fitted to improperly related jaws, therefore, can no more be expected to function efficiently than gears can be expected to mesh if improperly related.

For this reason an understanding of what constitutes the normal functional relation of the mandible to the maxilla, and whether or not this relation is dependent upon a normal dentition, is essential. It is important to know whether this is a fixed relationship, determined and maintained by the size, form, arrangement, and limitation of the various components associated with it.

Corresponding Relation Exists—The mandible has no direct attachment to the maxilla (except a few fibers of the masseter and internal pterygoid muscles) which might influence its relation thereto. Its relation to the rest of the skeletal frame of the cranium and face must therefore be considered because for any relation of the mandible to the skeletal frame there will be a corresponding relation to the maxilla which is an integral part of the cranium and face.

Categories of Relationships

For the purpose of discussion, jaw relations may be divided into two categories:

(1) The vertical relation of the

mandible to the maxilla, commonly referred to as vertical dimension.

(2) Centric relation, or the horizontal relation of the mandible to the maxilla which includes both the anterior-posterior and lateral positions of the mandible.

Relationships not Independent—It is not inferred that vertical relation and centric relation are independent of each other, for such is not the case. Correct vertical relation is a prerequisite for true centric relation; and true vertical relation is attainable only with the mandible in correct centric relation.

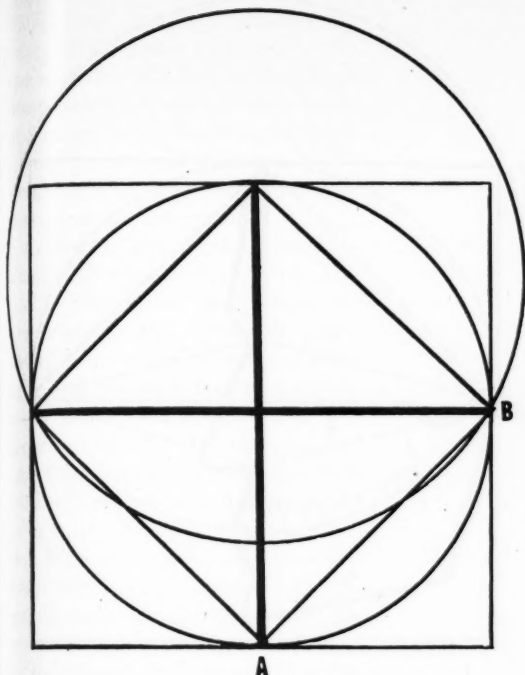
Vertical Relation—With the condyles of the mandible seated in their respective fossae, the jaws are in normal functional vertical relation when the inclined plane of the body of the mandible is parallel with the inclined plane of the maxilla. Note that no reference has been made to the alveolar process.

Centric Relation—With the jaws in correct vertical relation and both condyles seated in their respective glenoid fossae, the mandible is in centric position in relation to the fossae.

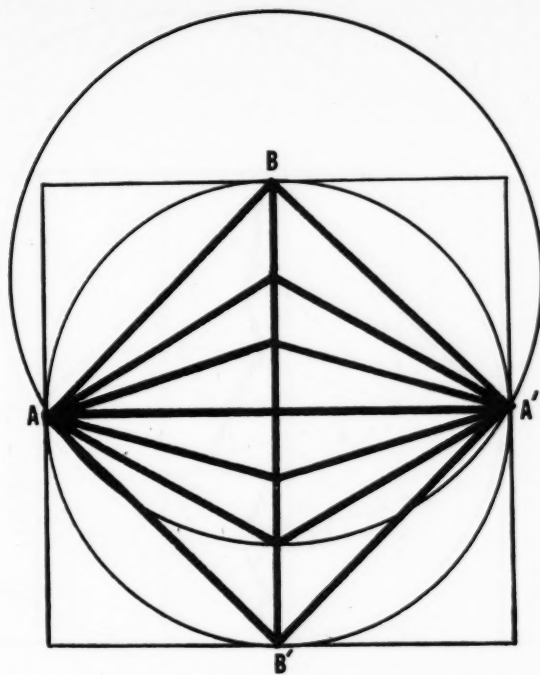
A Fixed Relation—It appears certain that the relation of the mandible to the rest of the cranium and face is a fixed relation, established and maintained by the size, form, and arrangement of the bones of the head and face which form a universal biomechanical pattern. It is also evident that the teeth serve to support the lower third of that pattern at its functional vertical level.

Development of Teeth a Progressive Process

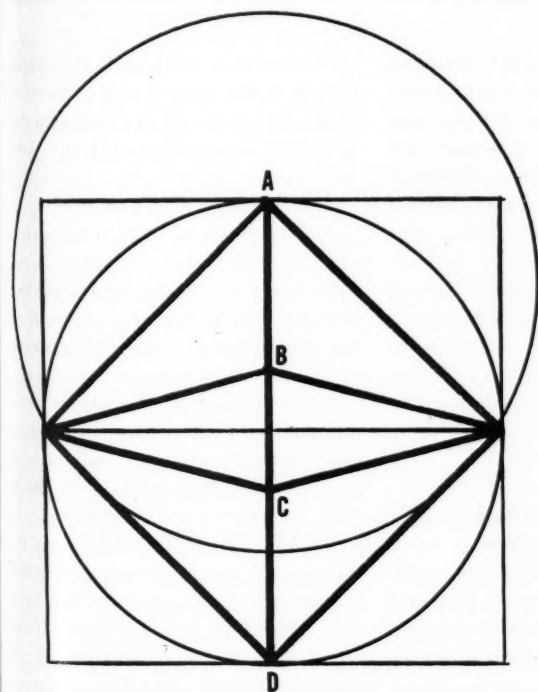
Approximately twenty years are required to produce what may be con-



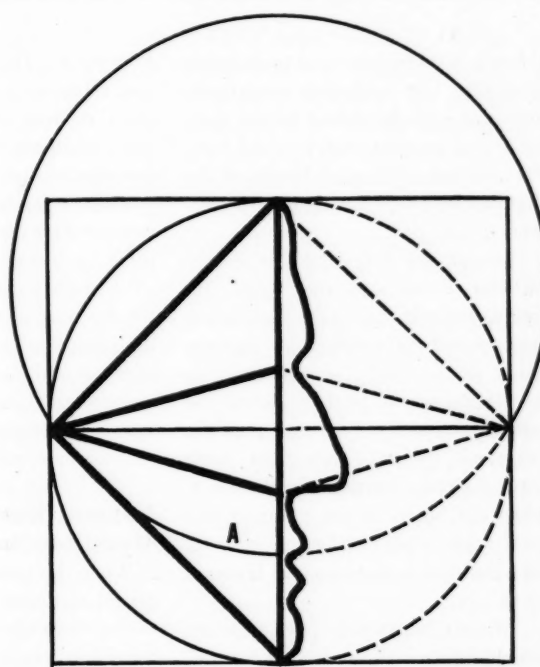
1. The basic pattern of the skeletal frame of the cranium and face consisting of the square, circle, and triangle, the basic forms of symmetrical figures. (A) represents the vertical and (B) the horizontal center lines of the face.



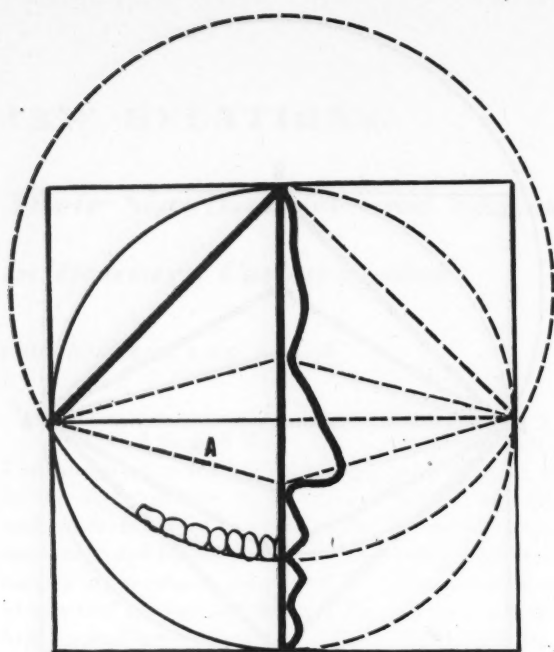
2. The pattern of the face divided into six equal parts by means of lines radiating from the head of the condyles of the mandible (A and A'), and converging at the vertical center line of the face (B and B'), illustrating its forward development.



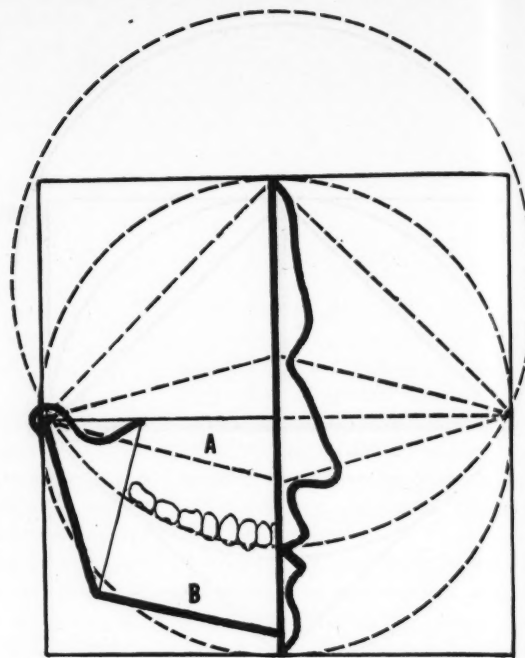
3. The face divided into three equal parts with respect to the head of the condyles of the mandible. The converging lines meet at definite landmarks along the vertical center line of the face. (A), the normal hairline, (B), the nasal notch of the frontal bone, (C), the ala of the nose, and (D), the point of the chin.



4. A symmetrical outline of the profile of the face drawn according to the fixed landmarks illustrated in Figure 3. The compensating curve (curve of Spee) is also shown (A).



5. The upper two-thirds of the pattern of the face which is fixed and maintained by the integral bones of the cranium and face. The lower border line (A), extending from the head of the condyle to the ala of the nose, represents the inclined plane of the maxilla.



6. The upper two-thirds of the pattern of the face and the basic outline of the mandible.
Note: The inclined plane of the body of the mandible (B), is at right angles to the anterior border of the ramus and parallel to the inclined plane of the maxilla (A).

sidered a complete and permanent dentition. The process is progressive and support is furnished for the mandible and its relationship to the maxilla and other integral bones of the cranium and face during the developmental period.

Normal Jaw Relations Evolve with Skeletal Frame—In the infant the tongue fills the oral cavity, furnishing support and maintaining jaw relationships. In the child, periodic eruption of the deciduous teeth performs the same function. In the youth periodic eruptions of the permanent teeth serve a similar purpose. In the adult, when the bones of the cranium and face reach their maximum growth, the relationship matures and becomes fixed.

Normal functional jaw relations are established as the face is formed. They are governed and maintained by the size, form, and arrangement of the skeletal frame of the cranium and face, and are supported by the natural dentition.

Theory of Acquired Relationships

Untenable—The theory that retaining jaw relations resulting from impairment or loss of natural teeth, and acknowledged to be incorrect and conducive to progressive malfunction, is without validity. So-called acquired relationships are conditions that originate in necessity and the objective of dentists is to restore full support for the normal functional relation of the mandible to the maxilla. The patient should be provided with improved functional performance rather than be compelled to adjust to a cumbersome malrelationship.

Normal Basic Relation of Mandible to Maxilla

When the jaws are in correct vertical relation with both condyles seated in their respective glenoid fossae, the mandible is in centric position in relation to the fossae.

Mandibular Movement Controlled by Fossae—Because the glenoid fossae furnish the seat in which the condyles of the mandible rest, they serve to guide and restrict mandibular

movement and are highly important factors in the control of the position of the mandible and its relation to the associated bones of the cranium and face.

Reliable Method Available—A precise and reliable method of acquiring centric relation was evolved by Gysi some years ago. Notwithstanding the fact that this method is recognized as the most scientific and reliable means available for obtaining centric relation, it would appear that only a small percentage of dentists use it as a routine practice. Rather, reliance is placed upon less dependable methods with consequent disappointment.

Method Uncomplicated—The reluctance of many dentists to use the gothic arch tracing may be due to a false belief that it is a difficult, time-consuming process or to the use of the complicated, unstable, and imperfect equipment which has been provided.

With reasonable care, however, and the use of simple stable equipment, correct centric relation may be

simply and quickly obtained by means of the gothic arch tracing. No special skill is required as the patient demonstrates its location. Many hours of time are saved. Resetting the teeth, attempting to grind them into occlusion, and sometimes having to make them over are unnecessary.

Record of Movements Provided—

The gothic arch tracing is a registration by the patient which shows the limitation of the horizontal movements of the mandible within a given area, and represents the extent of posterior mandibular movement. It is a record of the alternate right and left lateral movements of the mandible with one or the other condyle seated in its fossa. The pointed apex or junction of the two converging lines which form the arch, as indicated by the gothic arch tracing, represents the point where both condyles are seated in their fossae. It is evident that this point must be, and is, the centric position of the mandible as related to the fossae and other integral bones of the cranium and face.

Functions of Gothic Arch Tracing

The following information is provided by the use of the gothic arch tracing:

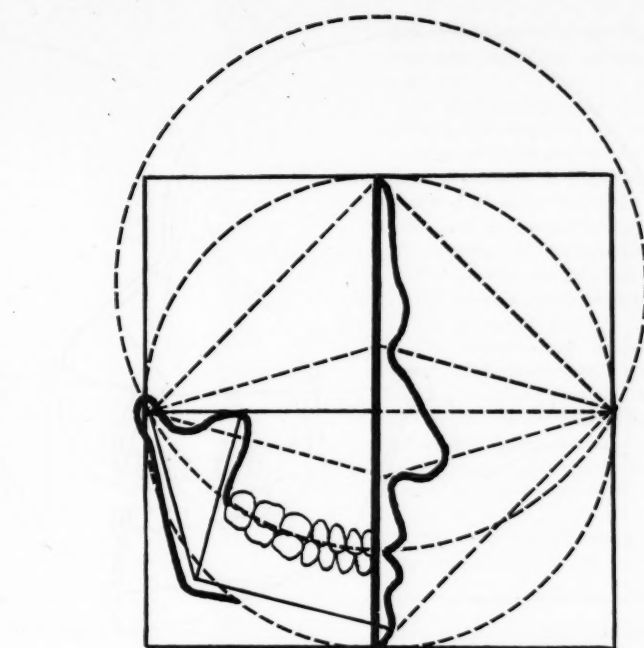
1. A rounded apex of the arch indicates a protrusion of the mandible. This is unacceptable for proving the point of centric relation.

2. Markings that may occur within the border of a gothic arch tracing represent the inherent, but limited, flexibility of the ligaments associated with the temporomandibular articulation and are of little, if any, importance.

3. All true gothic arch tracings made by patients are of the same angle, indicative of a universal course traveled by the mandible in its functional activity.

4. The patient is supplied with a simple, stable means of support for the mandible and a smooth surface is provided upon which to record unhampered mandibular movements.

Means of Establishing Planes Necessary—It has been stated that with the condyles of the mandible seated in their fossae the jaws are in normal functional vertical relation when the inclined plane of the body



7. The general outline of the mandible, which, together with the teeth and alveolar process of the maxilla, forms the lower third of the pattern of the face when the mandible is in normal, functional vertical relation.

of the mandible is parallel with the inclined plane of the maxilla. It is implied in this statement that some means must be obtained of establishing these planes and of comprehending the mechanism governing the degree of separation at which the planes may be paralleled.

Key to Functional Efficiency

The correct normal vertical relation of the mandible to the maxilla and other integral bones of the cranium and face has the following functions:

- (1) It is the key to the functional efficiency of the dental mechanism.

- (2) It preserves the harmonious contour of the face and prevents the distortion of the muscles of expression.

- (3) Normal vertical relationship maintains the normal position of the temporomandibular articulation.

- (4) The teeth are relieved of undue stress, contributing to the health and vitality of their supporting structures.

- (5) Correct vertical relation of the mandible to the maxilla prevents strain and fatigue of the muscles of mastication, preserving their tone and maintaining their equilibrium with the depressor muscles.

- (6) It conserves the flexibility and strength of associated ligaments.

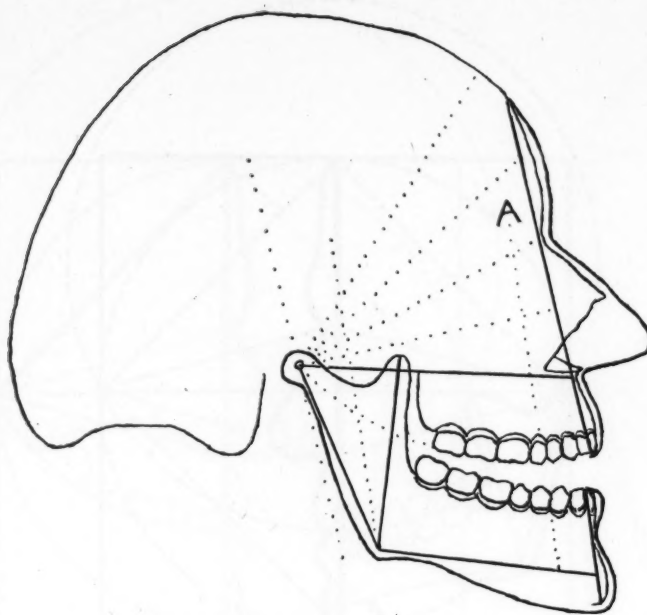
- (7) The function of deglutition is facilitated.

- (8) This relation is the basis of balanced occlusion, causing the teeth to come into contact when their occlusal surfaces are at right angles to the direction of force, providing stability and maximum crushing power.

- (9) A prerequisite to true centric relation, correct vertical relation is an important factor in the preservation of alveolar tissue.

Biomechanical Pattern—The hypothesis concerning the present concept of the vertical relation of the mandible to the maxilla is based upon the following premises:

- (1) The skeletal frame of the human face originates at like centers and develops along definite lines, forming a universal biomechanical



8. The pattern of the face in profile with the mandible in open vertical relation. With the mandible in open vertical relation, a line extending from the point of the angle of the mandible and passing through the center of the coronoid process is at right angles to the inclined plane of the body of the mandible and at an obtuse angle to the inclined plane of the maxilla.

None of the teeth is in contact and the direction of force "A" is upward and forward with respect to the vertical median line of the face.

pattern designed to facilitate the coordination and function of the mandible and its associated structures.

(2) This pattern is applicable to all human faces, notwithstanding differences in size, form, length, or breadth (with the exception of deformities).

(3) The pattern is not changed by the growth, development, or atrophy of the skeletal frame of the face; from a physiological standpoint it remains constant throughout life.

(4) The proportion of the upper two-thirds of this pattern is main-

tained by the integral bones of the skeletal frame of the cranium and face, while from a functional viewpoint the proportion of the lower one-third is supported in a large measure by the normal dentition.

Results of Altered Proportions—The lower proportion of the pattern may be altered by the loss of teeth, by abrasion, or by other abnormalities of the natural dentition. The result is a diminution of the lower pro-

portion which has the following effects: (1) the vertical dimension of the face is adversely affected; (2) the muscular balance of the dental mechanism is upset; (3) the condyles are in malposition in the temporomandibular fossae; and (4) the angle at which the mandible normally approaches the maxilla is changed which reverses the direction of force normally exerted by the mandible against the maxilla.

All of these effects impair the maintenance of health, function, comfort, and facial expression.

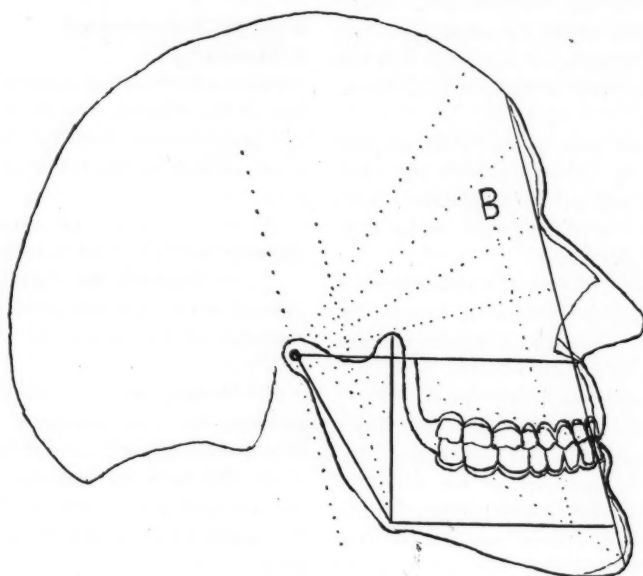
Use of Pattern—By the intelligent use of this pattern it is a relatively simple matter to determine the extent of closure occasioned by any alteration or loss of the normal dentition and to restore to normal the function-

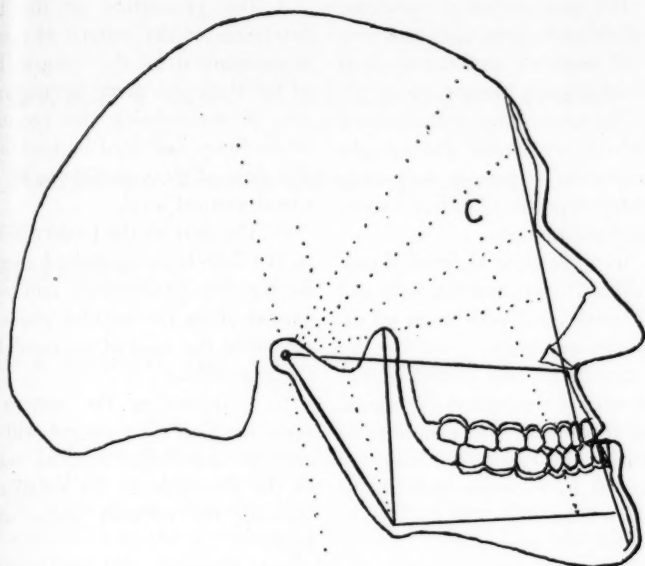
9. The pattern of the face in profile with the mandible in normal functional vertical relation.

In this relation the line from the point of the angle through the coronoid process is at right angles to both the inclined planes of the body of the mandible and the maxilla with those planes parallel to each other.

All of the teeth are in occlusal contact and the direction of force "B" is upward and parallel to the vertical median line of the face and also parallel to the long axis of the teeth and at right angles to their occlusal surfaces, indicating an even distribution of force over the masticating area.

Note the harmonious contour of the face.





10. The pattern of the face in profile with the mandible in closed vertical relation.

In this relation the line from the point of the angle of the mandible and passing through the center of the coronoid process is at right angles to the inclined plane of the body of the mandible and at an acute angle to the inclined plane of the maxilla.

The percentage of closure is greater in the anterior part of the mouth than in the posterior portion.

The direction of force "C" is upward and backward with respect to the vertical median line of the face and the teeth are in malocclusion, all of which indicates an uneven distribution of force over the masticating area and signalizes a progressive malrelationship.

Note the inharmonious contour of the face.

al vertical relation. In this way the abnormalities referred to can be corrected and to a large extent the difficulties experienced by the dentist and the patient in the construction and use of artificial dentures can be eliminated.

Biomechanical Pattern Basic Factor

Because bone constitutes the fun-

damental element of all articulations, and each articulation of the skeletal frame of the body forms a universal biomechanical pattern to facilitate its function, it is obvious that the universal biomechanical pattern of the skeletal frame of the head and face is the basic factor in fixing the position of the mandible and its rela-

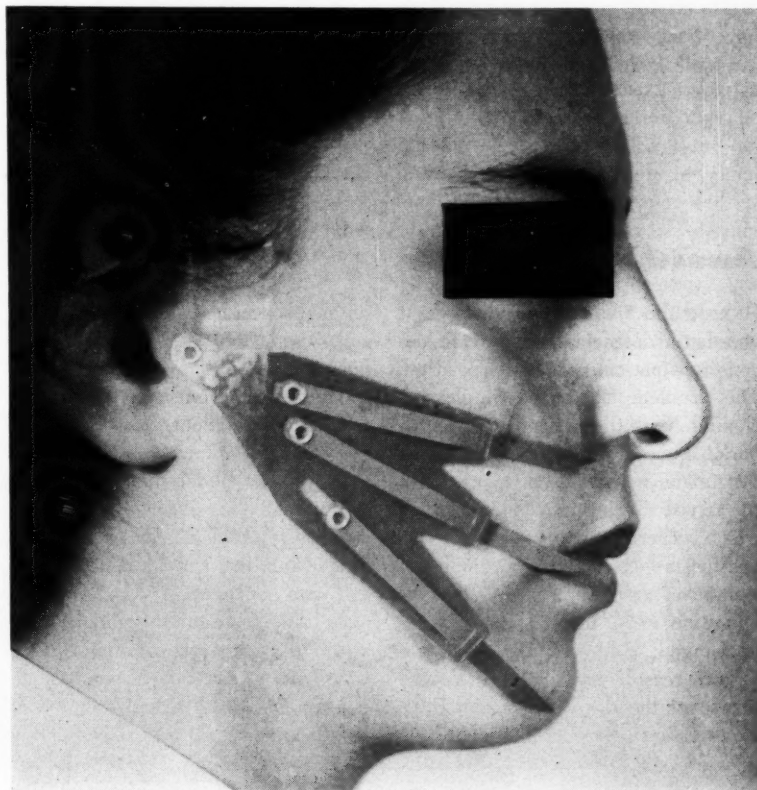
tion to the maxilla and other integral bones of the cranium and face. The muscles, ligaments, and teeth are supplemental factors that contribute to the support, maintenance, and functional activity of that relationship.

Accurate Guide Provided—It is also obvious that the part of the pattern relating to the face (composed

11. The Vertical Relator in position on the face. The relator conforms to the lower third of the universal biomechanical pattern of the skeletal frame of the face.

The base line used for its proper placement on the face is the inclined plane of the maxilla which follows a line extending from the head of the condyle of the mandible along the lower border of the zygomatic arch and malar bone; thence across the superior maxillary bone to its junction with the corner bone at the ala of the nose. (As represented by the superior border of the upper arm of the relator.)

When placed on the face in this manner, with the adjustable arms extended to reach the vertical median line of the face, the pointed end of the middle arm will show the occlusal plane of the anterior teeth; and the pointed end of the lower arm, when resting on the crest of the mental process of the mandible (or point of the chin), will indicate the normal functional vertical relation of the mandible to the maxilla and other integral bones of the head and face.



of segments having like proportions and evenly spaced along the sagittal plane with respect to the head of the condyles of the mandible) provides an accurate guide (1) for determining the normal functional vertical relation of the mandible to the maxilla in edentulous cases, and (2) for indicating the occlusal plane of the teeth.

Horizontal Planes Ineffectual—Different observers, at different times, noting the similarity of the structure of the human face, have endeavored to determine its pattern and divide it into segments by the use of horizontal planes and variable guides, only to find the proportions to be unequal and void of fixed landmarks.

Segments of Equal Proportions—The rotating axis of the mandible is used as the base with lines radiating from the head of the condyles of the mandible and converging at the vertical center line of the face. A pattern is formed that may be divided into segments having equal proportions and possessing fixed landmarks represented by the length of the face and the union of its segments.

Results of Clinical Experience—While clinical material and facilities have been somewhat limited, those available include the following applications:

(1) The examination of numerous skulls of different sizes, ages, and condition of dentition and the application of the pattern thereto.

(2) The application of the pattern to hundreds of profile photographs in newspapers, magazines, and other periodicals of people of different ages, nationalities, and sex.

(3) Its application to faces of people of different ages and sex, with and without teeth, and with faces of diverse forms and sizes.

(4) Successful use of the pattern in determining the correct functional vertical relation of the mandible to the maxilla in edentulous cases is evidence of its accuracy and practicability in function.

Summary

1. The skeletal frame of the cranium and face forms a universal biomechanical pattern to facilitate the coordination and function of the mandible and its associated structures.

2. This pattern is established during the formative period of the face and is not altered by subsequent growth and development.

3. The position of the mandible and its relation to the maxilla and other integral bones of the face are fixed by the pattern.

4. The proportion of the upper two-thirds of the pattern of the face is maintained by the integral bones of the face. The teeth are major factors in maintaining the proportion of the lower one-third by limiting the elevation of the mandible to its functional vertical level.

5. The part of the pattern relating to the face is composed of segments having like proportions and evenly spaced along the sagittal plane with respect to the head of the condyles of the mandible.

6. A replica of the pattern laid upon the face of a patient will indicate the functional vertical relation of the mandible to the maxilla and indicate the occlusal plane of the teeth.

7. Supplementing the author's hypothesis on vertical relation, Figures 1 to 7, inclusive, show the pattern of the face in progressive stages. Figures 8, 9, and 10 are photographs of a Mand-o-Max manikin, showing the pattern of the face in profile, illustrating the relationship of the mandible to the maxilla in open, normal, and closed vertical relation and the effect of those different relations upon facial contour and functional performance.

1505 South Grand Boulevard.

Anesthetic Deaths

ONE OF the most common causes of anesthetic deaths is nursing the unconscious patient in a faulty position. The problem is one of simple mechanics. With the patient lying on his back, if the jaw is left unsupported, the tongue will fall back and occlude the airway. This is an elementary fact which generations of instructors in anesthesia have drilled into their students over and over again. When the operation ends, this danger remains unchanged. And yet, for some unknown reason, the anesthetist may turn over the unconscious patient to an attendant who puts the patient flat

on his back in bed and leaves him unsupervised, often for considerable periods.

There is only one way to nurse an unconscious patient. He should be placed in a semiprone position, with a firm pillow under the chest to prevent him from rolling onto his face, and his lower arm should be drawn behind him to ensure that he will not roll onto his back.

In this position, the tongue falls away from the posterior pharyngeal wall, and a blood clot, vomitus, or any foreign body drains out of the mouth and not into the larynx. It is

a very good position, especially for patients recovering from tonsillectomy, laparotomy, or virtually any other operation. In this position, the patient who has been deprived of his protective reflexes is the moral responsibility of the anesthetist. Of course, the anesthetist cannot stand by each patient until he recovers but, in delegating his responsibility, he should insist that the patient be placed in a safe, prone position.

From *Journal of the American Medical Association* 150:545 (Oct. 11) 1952.

SURGERY vs. BACTERIOLOGY

In Pulpless Tooth Management

PART THREE

PHILLIP M. CHERNOFF, D.D.S., Middletown, Conn.

DIGEST

The intention of this series of articles is to emphasize the surgical approach to the problem of treatment of the pulpless tooth. Inasmuch as a canal filling is a corollary and an adjunct of apicoectomy, this measure is an extremely important phase of the surgical approach to the problem. This article, therefore, which is the third in the series of four, deals specifically with a technique for canal filling which is applied by the author with highly successful results.

Root Canal Filling

When root canal fillings are contemplated, it must be remembered that the pulp canal is not conical and that it may be irregular in outline and shape.

Clinical Radiograph Two Dimensional—The usual clinical radiograph discloses the labiolingual perspective showing only the length and the mesiodistal width, and presents no information as to the probable width

and curvature of pulp canals in the labiolingual dimension. The radiograph is a two dimensional diagnostic aid and is therefore incomplete. The operator must be conscious of the third dimension, i. e., the "depth" that is not disclosed by the radiograph in a labiolingual exposure (Fig. 1).

Anatomic Irregularities Present Problem—In the process of cleansing the pulp canal the following mechanical obstacles may have to be overcome:

1. Curvatures
2. Constrictions
3. Bifurcations
4. Denticles
5. Pulp stones
6. Partial obliterations

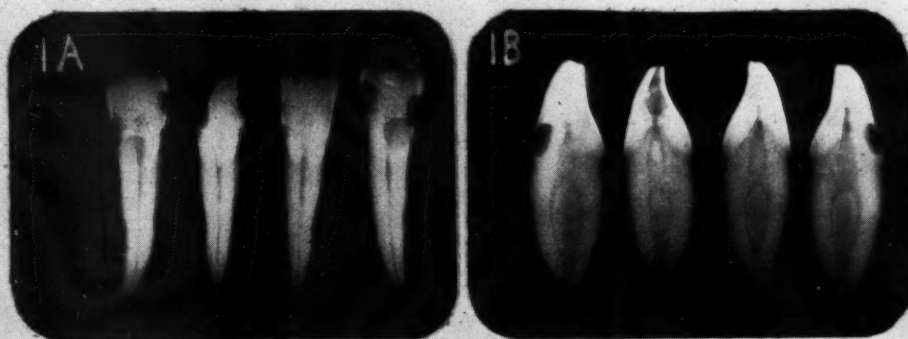
1. (A) Radiograph in labiolingual exposure of lower incisors showing narrow canals in the mesiodistal dimension. (B) The same teeth radiographed in the mesiodistal exposure showing that the canals are broad in the labiolingual dimension.

Obstacles Overcome by Instruments

—The anatomic irregularities described are relatively inconsequential in the process of canal filling. When the operator has succeeded in removing all the contents of the pulp canal, his instruments must necessarily have penetrated and negotiated such anatomic irregularities as exist. A broach that has negotiated the entire length of a canal in the cleansing process can carry a fluid sealing medium to and beyond its greatest point of penetration.

Prevention of Infection—The purpose of filling the pulp canal is to prevent infection or reinfection by sealing actual or potential avenues of communication between infective elements in the canal and dentinal tubuli on the one hand, and the periapical area on the other, and vice versa. A focus of infection may be initiated from either direction; an unfilled apical section of the canal may invite accumulation of serious exudate which will stagnate, decompose, and harbor bacterial growth (Fig. 2).

Undesirable Results Eliminated by Apicoectomy—Much has been written about the failures of pulpless





2. Unfilled part of canal at the apical end invites bacterial growth and supuration.

tooth management resulting from overfilling and underfilling root canals. Both of these undesirable results are eliminated by apicoectomy because this procedure affords the opportunity to achieve a canal filling that is flush with the resected root end.

Available Materials— Among the many different materials that have been used for canal fillings are the following: Gold foil, lead, tin, cement, amalgam, copper amalgam, copper, silver, various pastes, and even a gold-tin-mercury-platinum mixture.

Use of a Sealer— Several “sealers” have also been recommended for sealing the dentinal tubuli before the insertion of the canal filling material. A chloroform-rosin varnish used for this purpose is simply made by permitting a small piece of rosin to dissolve in a small amount of chloroform. In solution it is carried to the dry canal and pumped in with a broach. Special “sealers” are not really necessary, however, and tend to complicate what is actually an extremely simple procedure.

The dentist may use the agent of choice, provided that it is possible to secure a compact non-shrinking seal of the sides of the canal and the obliteration of its lumen. After experimenting with several materials the author prefers chloropercha with gutta percha.

Technique for Making and Applying Chloropercha

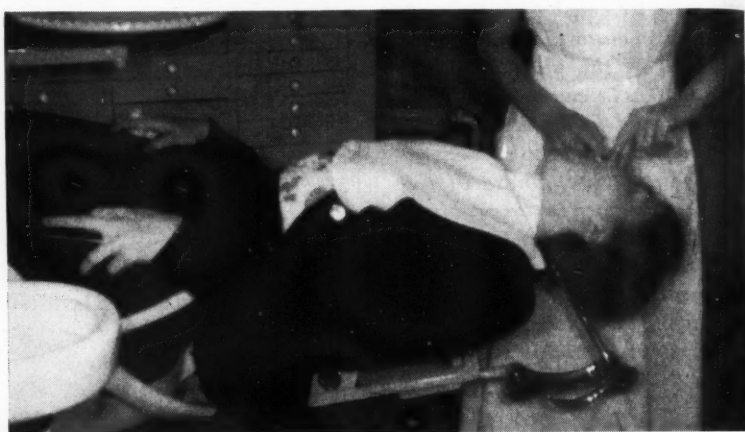
The following is the author's method of making and applying chloropercha:

1. For an upper tooth the patient is placed in a reclining position, with the back of the chair lowered as far as possible. The chair is then tilted backward so that the upper anterior teeth are at an angle that brings the incisal edges actually higher than the apexes (Fig. 3). This is done to enroll the help of gravity during filling. A drop or two of chloroform is pumped into the canal.

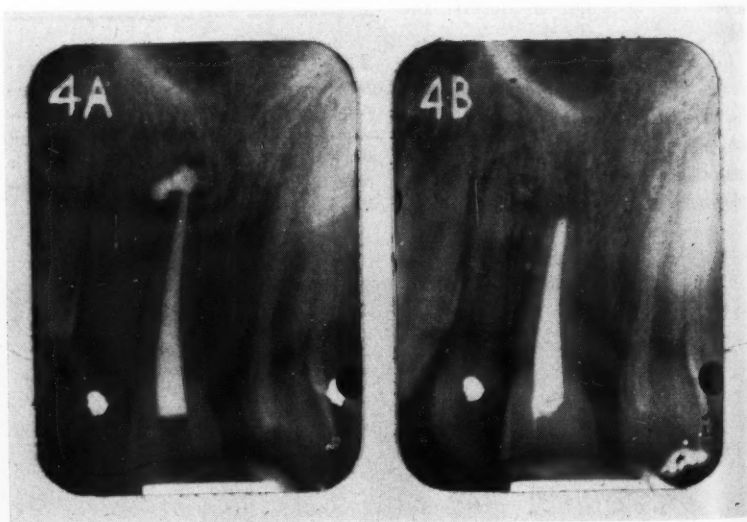
2. The chloropercha is brought in to the canal with a broach. A gentle pumping of the creamy chloropercha will ensure its flow to the apex or beyond.

3. The gutta percha points are introduced and condensed with pluggers. Sometimes only one gutta percha canal point may be necessary, but more often, two or three, or more may be required in the same canal.

4. To ensure lateral condensation, especially in upper centrals because of wide canals, a short length of a silver canal point is often inserted and forced into the gutta percha as



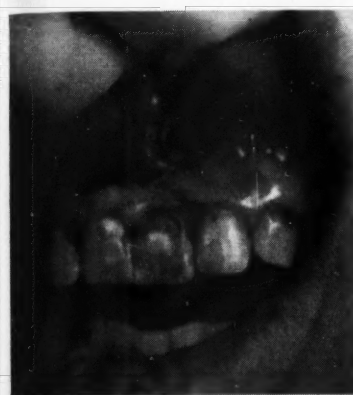
3. Patient in recumbent position. The incisal edges of upper anterior teeth are higher than the apexes.



4. (A) The canal is purposely overfilled with great pressure to ensure a lateral sealing of the canal walls. (B) All excess filling in the periapical area is immediately removed by apicoectomy and curettage.



5. Apex resected before filling the canal.



6. Showing filling material that was forced through the canal into the periapical area after resection of the root tip.

7. Showing a case in which a silver canal point was inserted from the resected end of the root to obtain a good lateral seal. (A) Preoperative radiograph. (B) Postoperative radiograph. (C) Radiograph of the case four years later.

far as it will go. This acts as a plunger and creates lateral as well as vertical pressure.

Alternative Technique

1. The canal is flooded with chloroform which is brought to the canal on the beaks of college pliers. With a gentle pumping of a broach it is carried to the apex.

2. When the canal is completely flooded with chloroform a gutta percha point is inserted into the canal and is gently rubbed along the sides of the canal.

3. The chloroform dissolves the outer surfaces of the gutta percha point, and as it is pumped along the sides of the canal, the chloropercha resulting from the dissolution adheres to the canal walls.

4. During this operation the recumbent position of the patient enlists the help of gravity in getting the chloropercha to the apex, and beyond. Pumping it in with the gutta percha point helps to secure a thorough seal.

5. More chloroform may be applied and a second gutta percha point brought in, or a third, or more, if necessary. The final condensation is completed by considerable pressure with pluggers on the gutta percha points.

6. Overfilling should be intentional as there is more likelihood of obtaining a satisfactory lateral seal when the canal is overfilled by great pressure than if only light pressures are applied.

7. All the excess filling material beyond the apex is to be immediately removed by apicoectomy so that overfilling should be of no concern (Fig. 4).

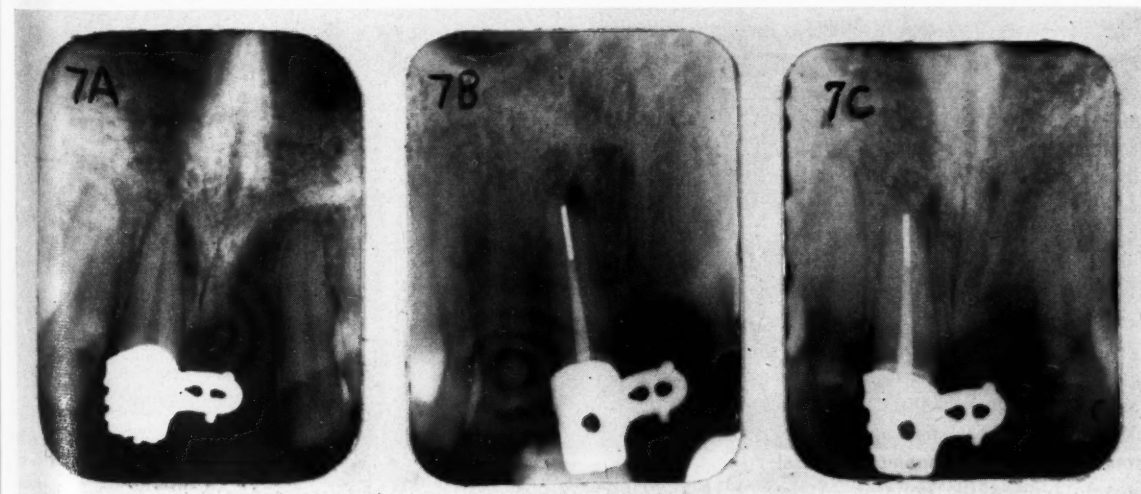
Additional Measures—1. The patient is now allowed to sit upright for the placement of the filling in the coronal section of the tooth. It is an inviolable rule to remove all gutta percha that may be in the pulp chamber, permitting none of the root filling to extend beyond the level of the gingiva, before placing the restoration in the coronal section.

2. Leaving an extension of gutta percha in the coronal area of a tooth, or any decay or organic material in the pulp horns, may result in subsequent discoloration of the tooth.

Variation of Method—1. In many cases the sequence of filling and resection must be reversed because of inability to establish dryness in the root canal. A continuous seepage of fluid from the periapical area is an obstacle to proper sealing of the dentinal tubuli. It is therefore advisable in such cases to resect the root before filling the canal (Fig. 5).

2. After resection, the periapical area is kept dry with the aspirator, the canal is cleansed, dried, and filled. With the periapical area exposed and continuously aspirated, the operator will have a clear vision of the field and will see the canal filling as it is forced through the apical end of the resected root (Fig. 6).

(Continued on page 116)



X-RAY All Delayed Eruption Cases

DAVID WALDMAN, B.S., D.D.S., Flushing, N.Y.

DIGEST

The dentist's desire to minimize to an anxious parent the retarded exfoliation of deciduous teeth frequently leads to unfavorable

sequelae. This case history demonstrates the advantages of obtaining the true evaluation of etiology and treatment which can usually be done by complete and thorough x-ray examination.

upper right central and lateral incisors.

Surgical Intervention—Under infraorbital and anterior palatine foramen anesthesia, an open view flap was made. After the mucoperiosteal tissues were raised, a window in the bone was made with an impactor. By careful elevation all odontomas were removed.

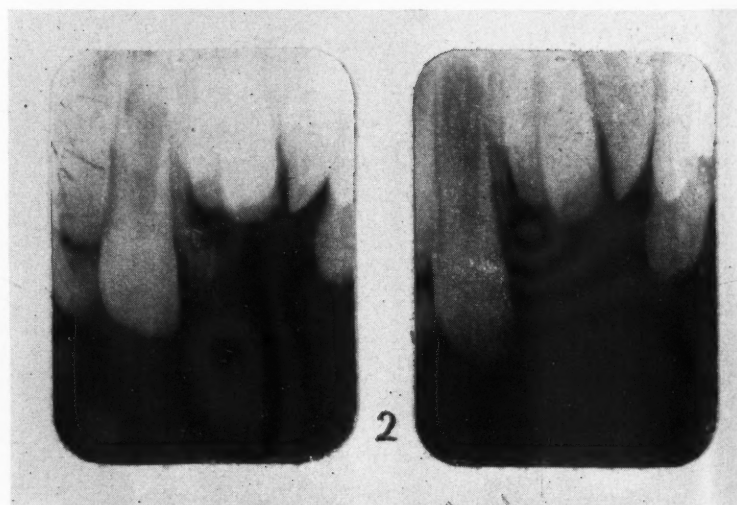


1. Preoperative x-rays.

Case History

A white, female patient, a child of eight years, presented with a history of unerupted upper right central and lateral incisors. X-rays were taken of this area to determine the cause of the slowness of eruption of these teeth. The upper left central and lateral incisors had erupted several months earlier.

Result of Examination—X-ray examination revealed several odontomas, two lateral incisors, and one central incisor. The effect of the odontomas and the supernumerary lateral was to prevent the eruption of the

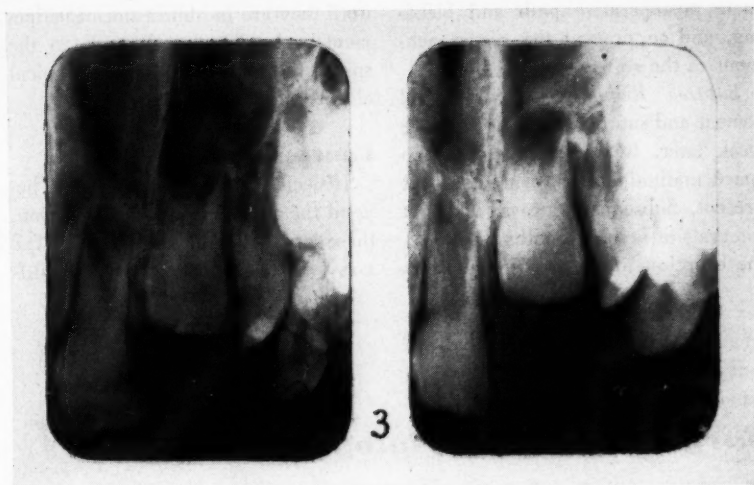


2. Revaluation x-rays to ascertain which lateral incisor should be extracted.

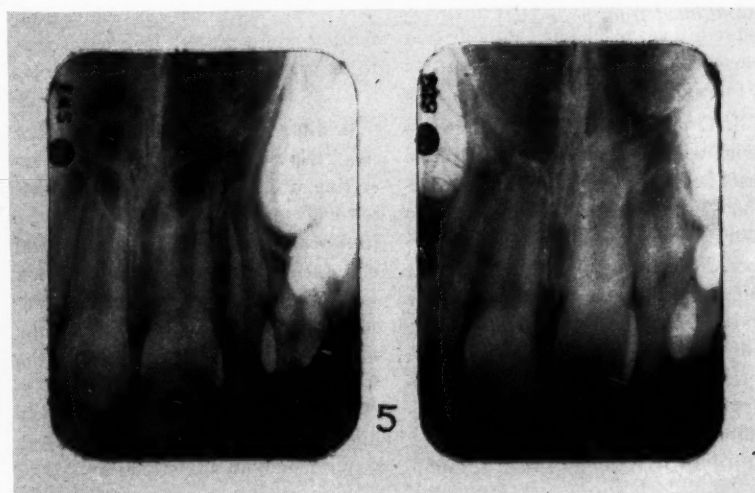
Final Surgical Measures

Before the completion of surgery, an x-ray was taken to aid in determining which lateral incisor should be retained for better positioning for normal eruption. The crowns of the remaining teeth, completely exposed, and the eruption pathway created are shown in the x-ray.

Use of Surgical Cement—Criss-cross black nylon sutures were placed to form a matrix for surgical cement. The surgical cement was used to elim-



3. Postoperative x-ray.



5. X-ray taken nine months after the first one. The upper right central and upper right lateral are shown in almost normal alignment in the arch.



7. Several of the odontomas and the supernumerary lateral that were removed.



4. Five months after the first x-ray was taken. Progress is shown of the upper right central and upper right lateral erupting without the use of an appliance.



6. The last x-ray taken, approximately a year and a half later, shows normal alignment of the teeth.

inate postoperative pain and bleeding, and to prevent the reencroachment of the soft tissue.

Sutures Removed—The surgical cement and sutures were removed one week later. It was decided that no space maintainers were necessary at present. Subsequent x-rays, taken at intervals of several months, show (1) the eruption of the exposed incisors

until they are in almost normal alignment in the dental arch, and (2) the spurts in the root growth and apical closure of these teeth.

Conclusion

If deciduous teeth are retained beyond the normal time for exfoliation, these areas should be x-rayed. The x-ray views should be taken from dif-

ferent angles. Parents should not be encouraged to believe that nature will eventually solve all abnormal conditions. There are many abnormal conditions which may cause delayed eruption of deciduous teeth. If possible, any abnormalities should be eliminated before complications develop.

176-17 69th Avenue.

Surgery vs. Bacteriology in

Pulpless Tooth Management

(Continued from page 113)

3. Condensation of the filling material will be more difficult in these cases because there will be no constriction of the apical end of the canal to restrain the material or to resist pressure. Nevertheless, it is quite possible to make a thoroughly compact filling under these circumstances by using more chloropercha and more gutta percha points than would be necessary in cases being filled before resection.

4. On several occasions the author has resorted to the expedient of inserting a short piece of silver canal wire (Jasper's silver points) into the canal filling from the resected apical end as an aid to ensure condensation (Fig. 7). The silver wire in these instances acts as a plunger forcing the filling material laterally against the walls of the canal.

5. After the canal is thoroughly filled, the excess material protruding

into the periapical area is easily removed and the dentinal tubuli at the resected surface are sealed with silver nitrate and eugenol.

Conclusion

With the technique described, the following advantages are obtained: (1) The canal filling is left flush with the resected surface of the root, (2) the canal is thoroughly sealed laterally, and (3) the resected dentinal tubuli are sealed with silver nitrate. The ultimate purposes of a root canal filling are achieved.

154 Broad Street.

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TONGUE DYNAMICS

IRVING M. SHEPPARD, D.D.S., New York

DIGEST

This article enumerates and describes dental deviations and abnormal conditions in adults due to abnormal tongue habits, in particular, abnormal swallowing where systemic disease is not an essential factor. Methods for correcting patterns of movement which may cause injury to teeth, gingivae, or bone, are suggested.

Importance of Diagnosis

The problem of migrating teeth, spaced teeth, crowded teeth, nonocclusion, protrusions, cross bite relationships, and other abnormalities caused by abnormal tongue movements has not been investigated adequately from a diagnostic point of view. Inasmuch as treatment depends largely on correct diagnosis, the importance of detecting such conditions is considerable.

Results of Abnormal Tongue Movements

Examples of the results of such tongue movements are the following:

1. (A) Anteriors in nonocclusion brought into contact by grinding the posteriors will result in nonocclusion again with evidence of closure in the joint. (B) Anteriors in nonocclusion corrected by orthodontia return to their original relation.
2. Mesiodistal spacing of anteriors corrected by orthodontia and restorations for contact is followed by labial movement and mesiodistal spacing.
3. Posterior teeth in nonocclusion, if rebuilt into occlusion, will be depressed in their sockets or moved buccally.

4. (A) Moderate protrusions of the lower jaw involving correction of premature contacts and a new edge-to-edge relationship result in nonocclusion of posteriors or a return to the original protrusion. (B) Extreme protrusions of the lower jaw, corrected surgically to a more normal relation, acquire a nonocclusion of the anteriors.

5. If anterior teeth are in nonocclusion and one is periodontally involved, it will move labially.

6. If anterior teeth are in nonocclusion and one incisor jacket is made with contact in centric, the tooth will move labially.

7. A bicuspid in linguoversion, moved buccally by tongue action where all teeth are present and in contact, will cause crowding of anteriors.

8. Destruction of lingual gingivae and alveolar bone may be caused by abnormal tongue movements.

Functions of the Tongue

The tongue, long used as an index of disease elsewhere in the body, has been a valuable aid in the diagnosis of many clinical entities including constipation, blood dyscrasias, and vitamin deficiencies. While the tongue itself can become diseased as in carcinoma and tuberculosis, as a cause of oral or dental disease the tongue has been relatively neglected, although orthodontists have associated "open bite" cases with tongue habits.

Normal Tongue Movements—Completing a series of complex rhythmical motions to facilitate the swallowing of saliva without aspiration into the lung, the tongue is normally active

the greater part of the day. Riesner,¹ in a cinefluoroscopic study, states that in swallowing the tongue redistributes itself into a flattened arrangement so that the anterior part lies in contact with the palate in the premaxillary area to act as resistance against propelling a bolus of food down the pharynx.

Incidence of Dental Deviation Reported—Rex² notes that the difference between the normal and abnormal swallower is that in the abnormal the teeth are not placed in occlusion; the tongue spreads its periphery through the separated teeth until it comes in contact with the cheeks and lips. This may be normal in the milk-drinking infant without teeth. Rex reports a far higher incidence of deviation from normal dentitions in children with abnormal swallowing habits compared to normal swallowers.

Abnormal Swallowing Habits in Children—On this subject Strang³ states, "Unfortunately, with great frequency we now find children exhibiting a form of swallowing that is extreme in muscular imbalance and that results in such intense pressure upon certain areas of the dental arches as to cause marked displacement of the tooth crowns. If these forces are active during the period of tooth eruption and overpower the normal forces, then the latter are unable to evolve normal arch form and occlusion."

Temperamental Influences—Strang, who notes this condition in children of excitable personalities also reports that sometimes the tongue is pushed against the lingual surface of the symphysis of the mandible; the external

¹Riesner, S.: Personal communication.

²Rex, R. E.: Deglutition of the Teeth, D. Rec. 66:103-108 (May) 1946.

³Strang, Robert H. W.: Orthodontia, ed. 3, Philadelphia, Lea & Febiger, 1950, p. 162.

pterygoid muscles then contract and force the whole mandible forward (1) in an effort to escape this tongue habit of pressure, or (2) as an exaggerated muscular act in the forced swallowing. This combination of forces seems to be conducive to the evolving of Class III cases.

Abnormal Swallowing Habits Occur Frequently—Strang⁴ observes abnormal swallowing habits to be one of the most common and influential muscular perversions encountered by the orthodontist. Tongue thrusting is also often associated with the functional act of swallowing, and this author comments that the pressure exerted in this muscular structure is strong and frequent.⁵

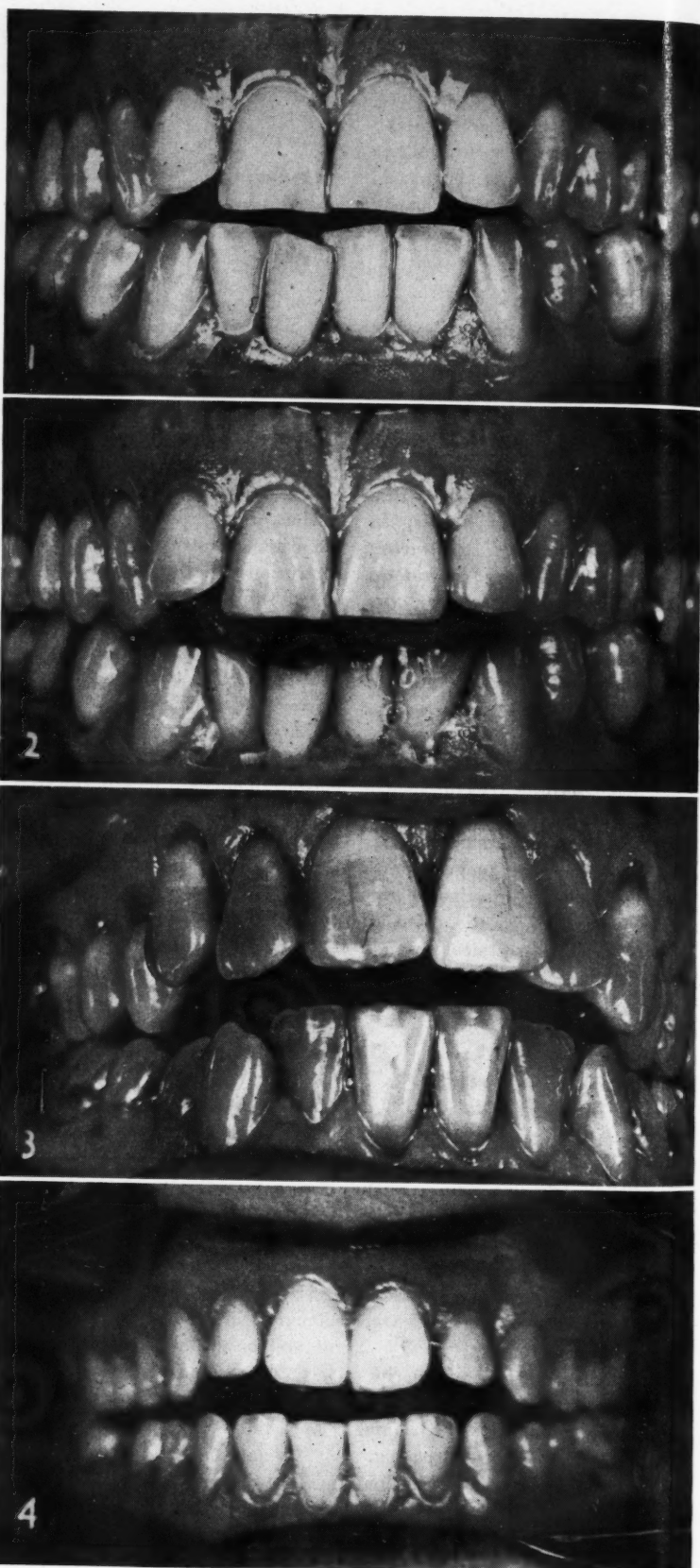
Abnormal Mouth Habits in Adults

Teeth that have assumed their places in the adult dental arch tend to continue eruption if they have no opponents. When the upper teeth do not occlude at all with opposing lower teeth, the presence of some abnormal factor may be suspected. While these cases of nonocclusion are in some instances attributed to (1) mongolism, (2) encephalitis lethargica, or (3) other systemic diseases, especially disorders of the higher central nervous system, many are caused by abnormal mouth habits such as (1) thumb sucking, (2) finger sucking, (3) lip biting, (4) pipestem and cigar holding, (5) the constant use of cigarette holders, and (6) atypical swallowing and tongue thrusting.

This article is concerned with the dental effects of abnormal tongue habits where systemic disease is not an essential factor.

⁴Strang, Robert H. W.: *Orthodontia*, ed. 3, Philadelphia, Lea & Febiger, 1950, p. 371.
⁵Strang, Robert H. W.: *Orthodontia*, ed. 3, Philadelphia, Lea & Febiger, 1950, p. 300.

1. Forward thrust case with vertical crowding and rotation of anteriors.
2. Same case as that shown in Figure 1, showing tongue in action.
3. Forward thrust case with crowding and rotation of anterior and vertical opening of anteriors and some posteriors.
4. Forward thrust with vertical opening and spacing of anteriors.



Dental Deviations Related to Tongue Habits

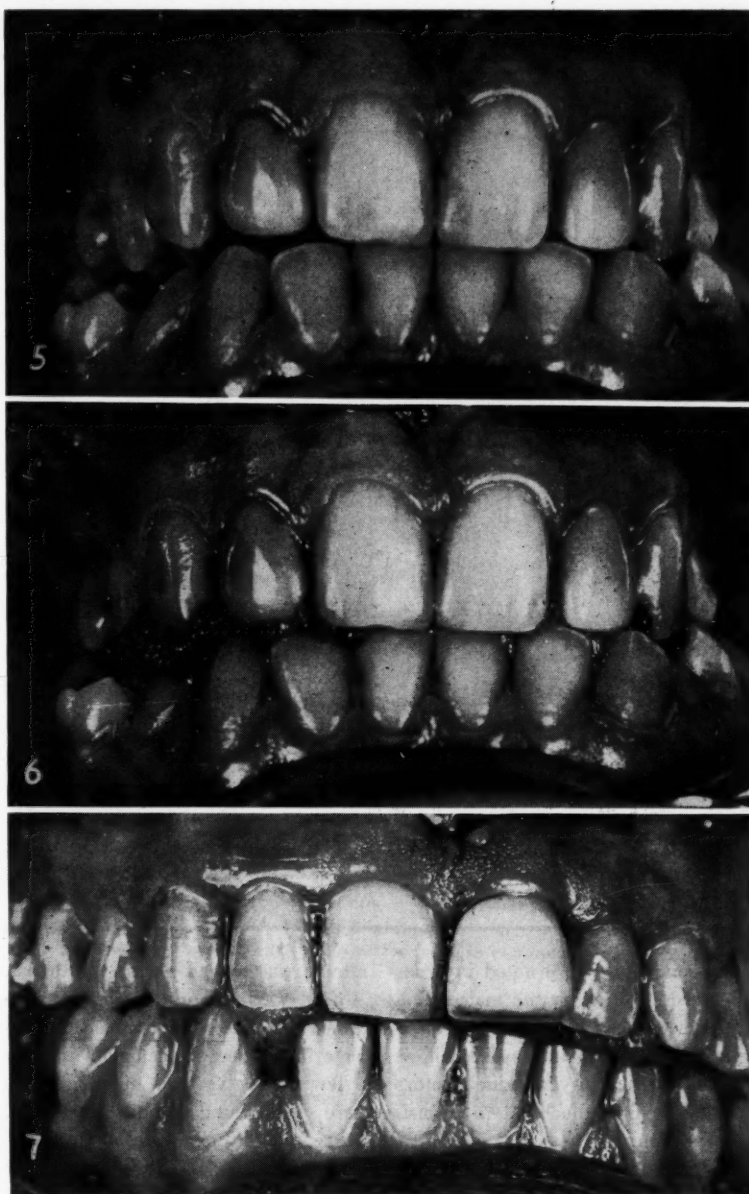
In addition to the nonocclusion or open-bite relationship are the following deviations:

- (1) Crowding and rotation of anterior teeth.
- (2) Spacing of anterior teeth (mesiodistal spacing).
- (3) A tendency toward protrusion of the lower jaw with an edge-to-edge bite or cross bite relationship.
- (4) Destruction of lingual gingivae and alveolar bone.
- (5) Temporomandibular joint disorders, bruxism, clenching, and clamping.

Nonocclusion—In the author's observation of dental deviations associated with abnormal tongue habits, nonocclusion was present in the largest group. A prominent characteristic of the nonocclusion group was the fact that crowding and rotation of anterior teeth were present in most of the patients.

Rotation and Crowding—Rotation was rarely seen without crowding. While the crowding and rotation appear in many tongue habit nonocclusion cases, these particular abnormalities can occur without nonocclusion with buccal movement of an upper bicuspid in linguoversion caused by a tongue habit. The buccal movement can force rotation of anterior teeth through the slimmed contours of their roots.

Mesiodistal Spacing—Another result associated with atypical swallowing or tongue habits is mesiodistal spacing. In these cases the lower anterior alveolar bone is labial to the upper, occasionally in the buccal segment as well. The teeth tend to edge-to-edge relationship and cross bite. If intensive tongue pressures, due to nervous habits, are present in addition to the atypical swallowing, the lingual gingiva and bone may be destroyed. Soreness of the tongue is present. If mesiodistal spacing is present where there is nonocclusion of anteriors, the tendency toward protrusion is less. This may be due to the fact that the tongue has "escape room" with the nonocclusion; the full



5. Lateral thrust with vertical openings in the posterior region with enlargement of the lower jaw.

6. The same case shown in Figure 5, showing tongue in action.

7. Forward thrust with vertical opening of anteriors and posteriors. Lingual resorption on upper left central incisor, apparently due to calculus, made this tooth more subject to the tongue pressure with resultant labial migration.

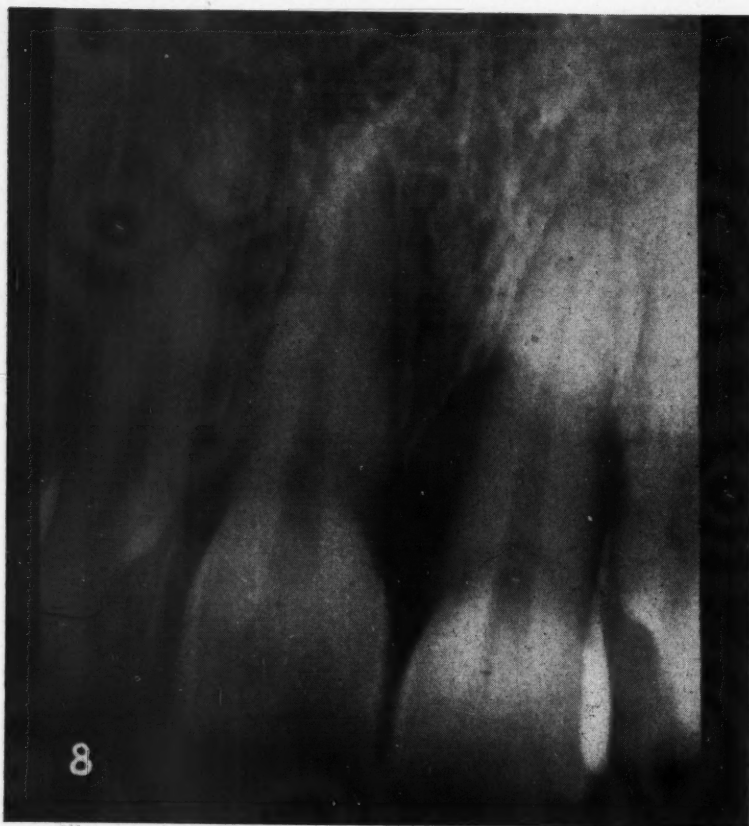
impact of the tongue against the lower jaw does not occur.

Temporomandibular Joint Conditions—Half of the atypical swallowing and tongue habit cases present temporomandibular joint symptoms accompanied by clicking, discomfort,

and pain. Almost as many display bruxism, clenching, and clamping habits. This figure may actually be higher because some patients may deny an existing habit and others may be unaware of grinding during sleep.

Psychogenic Factors Possible—The

¹Sheppard, I. M.: J.A.D.A. 31:384-385 (Mar. 1) 1944.



8. Roentgenographic view of the upper central incisor area of Figure 7.

latter conditions were noted in order to determine whether the malrelation of the teeth was caused by a mechanically abnormal manner of swallowing or whether psychogenic factors induced an infantile habit to persist. The incidence of bruxism, clenching and clamping would suggest the latter while anterior lingual resorption with ulceration of the tongue also indicates a psychogenic factor. Strang's "open bite" cases were all intense, excitable children but the adults in this series did not appear to be under nervous strain although tensility may well exist if the incidence of bruxism is an indication.

Result of Diminished Pharyngeal Reflex—Riesner,¹ expresses the opinion that the atypical tongue movements are due, among other factors, to a diminished pharyngeal reflex which permits a forward propulsion of the tongue. Many of the patients studied did not gag when a mouth

mirror was moved across the throat.

Few Periodontal Conditions Revealed—Despite the obviously incomplete imbalance of occlusion, in only a few of the vertical opening cases were periodontal conditions found. These conditions were in persons over the age of 30. It would appear that in the adult malpositioning of the teeth and jaws is maintained in a state of balance until some additional factor is introduced such as (1) resorption, or (2) orthodontic treatment. The former results in migration and rotation of the teeth and the latter, when removed, results in an approximation of the former tooth relationships if the pernicious tongue habits persist. The patient's complaint is the same in each case: recent drifting of the teeth.

Open Bite Relationship—While the nonocclusion cases are known clinically as "open bite" cases, the joint relationship is not one of an open

bite.¹ This is doubly significant because grinding of the posteriors for an esthetically acceptable relationship of the anteriors may cause subjective and radiographic symptoms of closure in the joint area while the tongue habit opens the teeth to their original "open bite" relation.

Methods of Correction

The atypical swallowing habit should be corrected whenever possible. A sugar-free lozenge retained on the palate should encourage posterior swallowing. If no natural teeth are present, sugar-containing confections may be used.

Development of Correct Habit—Another method, suitable for cooperative patients only, is to spend one-half hour a day for a month consciously swallowing in the usual way, thrusting the tongue forward or sideways as the case may be. Making the movement a conscious one appears to make it easier to learn to swallow in a backward direction.

Protection of Injured Area—For patients who have a nervous tongue thrust that is destructive, the injured area can be protected by a layer of highly polished processed acrylic. The smoothness of this material lessens the nervous habit and protects the teeth or soft tissues, or both, against the tongue action.

Area of Nonocclusion Provided—If full dentures are being made there should be an area of nonocclusion where the tongue may come through. If the direction of the tongue is downward and forward all the lower teeth should be set as low as possible with the anteriors in nonocclusion. Otherwise the lower denture will skid forward with each swallow, and after a period of time the lower denture will be found in a protrusive relationship.

Nonocclusion Maintained in Uncorrected Cases—With fixed and partial restorations in uncorrected tongue habit cases, nonocclusion where present should be maintained; otherwise the teeth will be depressed or moved buccally or labially. If there are mesiodistal spaces caused by an uncorrected tongue habit, splinting should be designed to allow

room for the tongue to come through.

Periodontal Therapy Important—
Inasmuch as one or more teeth subjected to tongue action become particularly vulnerable to migration if alveolar bone structure is lost, periodontal treatment is vitally important in these cases.

Summary of Forces in Abnormal Patterns and Results

Observation indicates that in the cases described the tongue with its extraordinary muscular capacity has chosen an abnormal pattern of movements which appear to exert the following forces and effects:

1. Forward Movement: (A) Nonocclusion of anteriors with crowding and rotation. (B) Nonocclusion of anteriors and some posteriors with crowding and rotation.

2. Forward and Upward Pressure: A slight enlargement of the upper jaw with spacing of the upper anteriors.

3. Forward and Downward Movement: (A) Enlargement of the lower jaw, a cross bite relationship of some or all teeth, and spacing of lower anterior teeth. (B) Tongue thrusting in addition to the abnormal swallowing pattern causing destruction of teeth, gingivae, and bone.

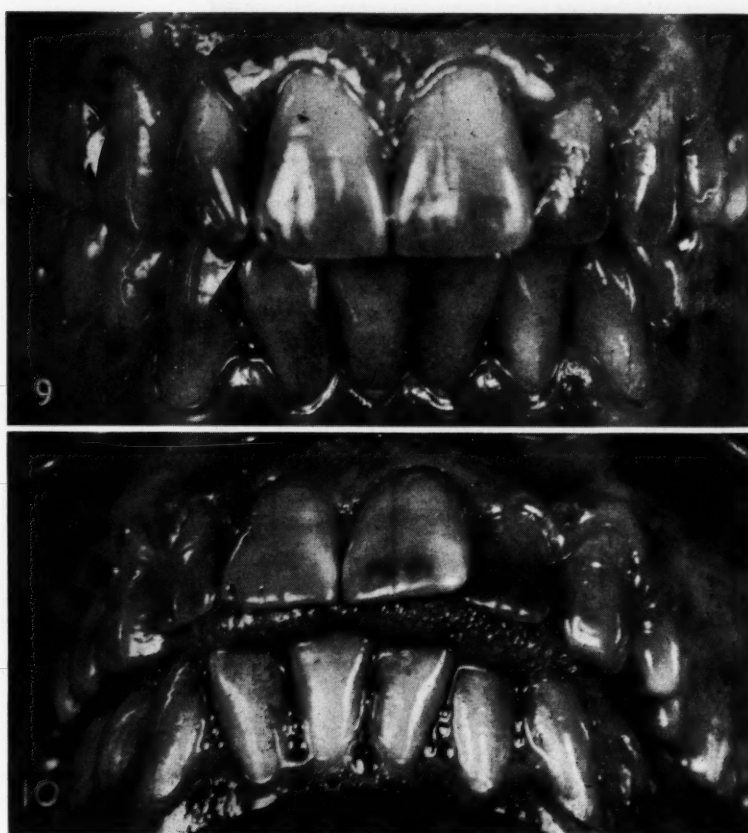
4. Lateral Force: Nonocclusion in the bicuspid area of one or both sides occurring with occlusal contact present elsewhere.

Methods to Determine Atypical Movements

(1) The patient may observe his own swallowing. If normal, there is momentary contact of the jaws in centric with an upward and backward force exerted by the tongue.

(2) A patient with an upper partial denture carrying anterior teeth is observed swallowing with the denture removed. The movement and force, it will be noted, is not forward.

(3) In the atypical swallowing



9. Forward thrust with some crowding and rotation of anteriors and the non-occlusion not ordinarily visible. See Figure 10.

10. The case shown in Figure 9. Posterior teeth in contact and the tongue thrust forward in the act of swallowing.

cases, the tongue will be observed to move through the spaces. There will be great difficulty in swallowing with the teeth in centric occlusion. Many of them will show facial movements in order to accomplish swallowing.

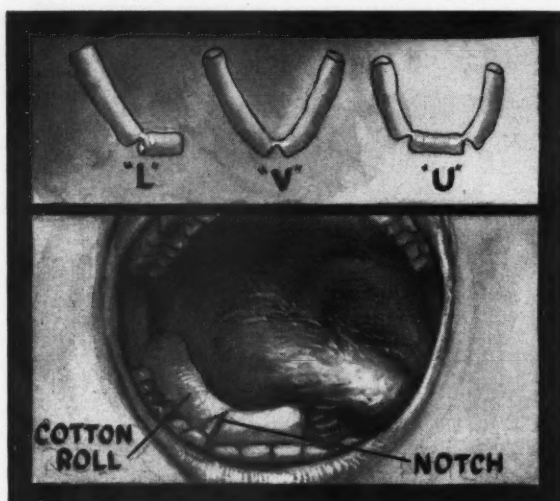
(4) The labial surfaces of teeth may be marked with indelible pencil near the mesiodistal space or near the incisal in areas of nonocclusion. Upon swallowing, the patient thrusts his tongue completely through the spaces and receives a sharp marking of the indelible lead.

Conclusion

The tongue is obviously an extremely powerful influence in tooth and jaw positioning and may be a source of injury. Inasmuch as new tooth and jaw relationships are undertaken on articulators having no facilities for duplicating the tongue action, the technique involved can be hazardous unless the muscular organ is taken into consideration.

5 East 57th Street.

1



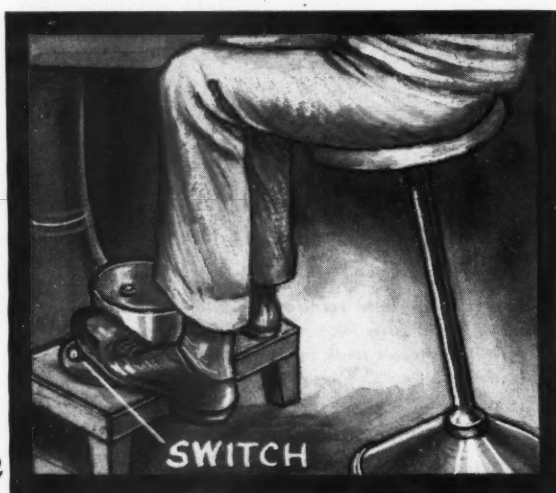
Clinical and Laboratory

Stabilizing Cotton Rolls

Charles B. Branson, D.D.S., Lincoln, Neb.

1. By notching a cotton roll in one of the forms shown in the illustration it may be more easily adapted to the shape of the lingual area of the lower jaw.

2

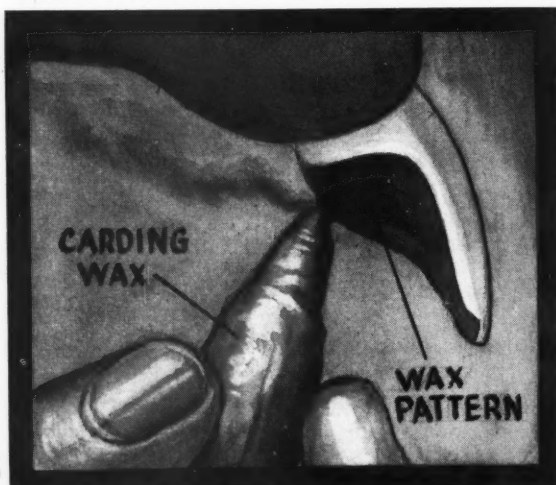


Use of a Footstool in Operating

Theodore L. Stein, D.D.S., New York

2. By placing the foot control switch on a footstool and using an operating stool, the operator may relieve himself of considerable leg strain.

3



Removal of a Wax Pattern

R. F. Krejci, D.D.S., Lincoln, Neb.

3. For the removal of an inlay wax pattern use a piece of carding wax rather than a sharp instrument.

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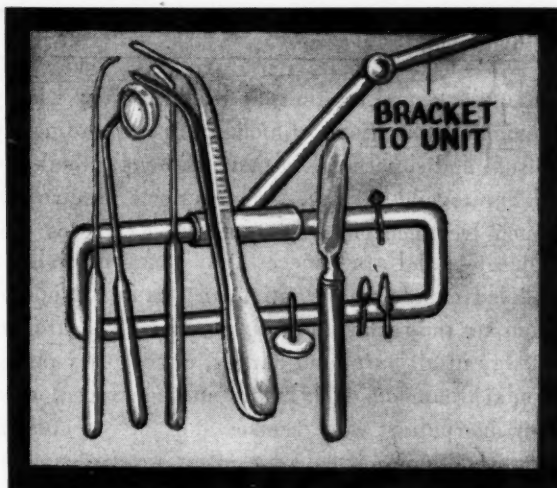
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

An Auxiliary Instrument Holder

Tom Wall, D.D.S., Seattle, Wash.

4. To relieve the congestion and the confusion on the bracket table an auxiliary instrument holder may be made by attaching a magnetic kitchen knife holder to the unit.

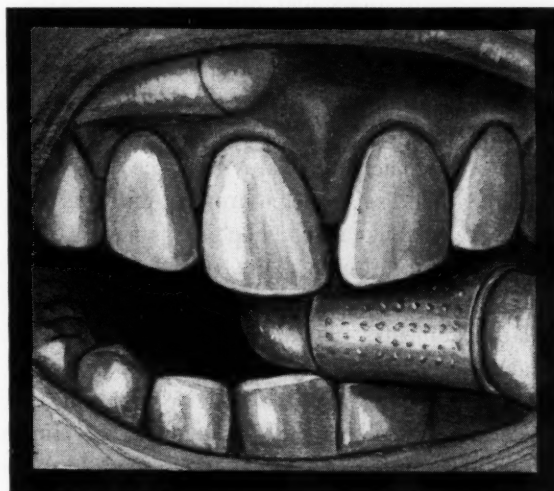


4

A Finger Guard

Leonard F. Menczer, D.D.S., West Hartford, Conn.

5. For the child patient who will intentionally bite the dentist's finger, or for the patient who lacks oral control, like the cerebral palsied patient, the use of an open-end thimble is recommended as an effective guard.

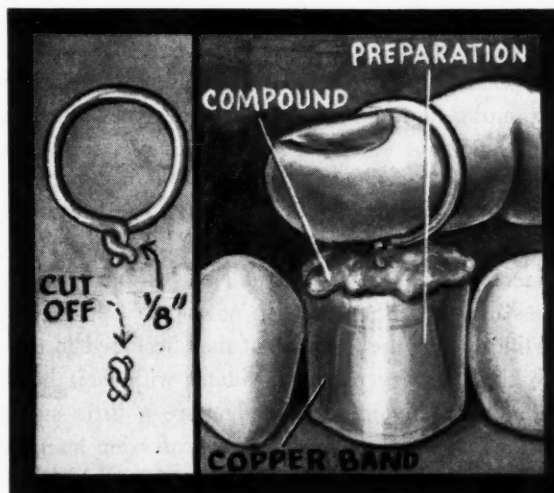


5

A Corkscrew Band Remover

Capt. William Granirer, USAF (DC), Sampson Air Force Base, N.Y.

6. A ring corkscrew that is supplied with cement liquid is cut as shown in the illustration. The end of the corkscrew is coated with sticky wax. When the copper band impression is ready for removal the end of the corkscrew is warmed and inserted in the modeling compound or wax. A finger is inserted through the ring for withdrawal.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 126 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

DIAGNOSTIC and treatment procedures vary widely among dentists. Some clinicians are extraordinarily casual and superficial in their methods; others are elaborate and precise. Some patients receive too much treatment in dental offices. Examples that come to mind are unnecessarily fancy procedures labeled mouth rehabilitation, the traumatic operations for the removal of impacted teeth that are out of way of all harm and danger, unnecessary periodontal treatments with knives and electrocauteries. For one patient who receives too much treatment, however, there are ten who do not receive enough.

The quality of dental care is as variable as the amount. Some patients are ministered to by dentists generously lacking in technical skill, whereas others receive restorations that are superb examples of craftsmanship. Unfortunately, in the tests of time, tissue tolerance, and susceptibility, the correlations between inferior workmanship and superior are not as true as they should be. Often the gold shell crown, the black amalgam slug, the abominably designed and executed denture give long and excellent service. Baked porcelain inlays and precision bridges often fail before less beautiful restorations. This is not an argument for poor techniques, but it is an argument for better diagnosis and treatment planning.

After a decade or two in practice we all develop, at least so we like to think, an unfailing clinical sense that guides us in classifying conditions and procedures. Often we are wrong. Experience is a valid teacher but it is not the only effective one. It is easy for us to use experience as the shield to cover bad habits, bias, and the iron fist of authority.

We may also use experience as a mask to blot out realities that we find unpleasant to accept. For example, the gold foil operator accepted the gold inlay without enthusiasm, the nitrous oxide anesthetist may view local anesthesia with hesitancy and hostility. The reverse is also true. The old-timers in practice were skeptical at the theory of focal infection when it was introduced while the graduates of 20 to 35 years ago now have a hard time relinquishing the theory that they accepted in their youth. The very recent graduates with their heads filled with biologic knowledge are a little supercilious to the older men in the profession many of whom were empirically skillful with their hands

but lacked a broad cultural or scientific training.

The time in which one lived and had his training is a factor in diagnosis. Many of the old practitioners who could not interpret an x-ray were extraordinarily keen of eye and observing. The clinical impressions that they made, although uncloaked in scientific jargon, were often fundamentally sound. These clinical impressions that stem from what the dentist sees at the dental chair are often more valid than the super-research that is bolstered with graphs, charts, equations, and awesome instruments.

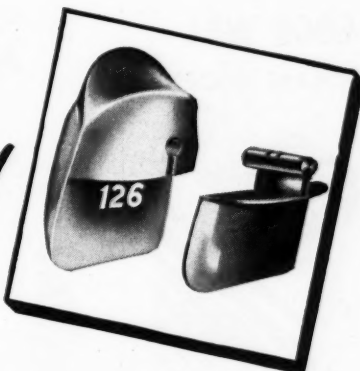
Unfortunately, many of the clinical impressions that have been registered by experienced operators have never been passed along to the profession. These experiences have not been made subjects of record from which other dentists might profit. What may appear as inconsequential, as "old stuff," as totally obvious to one dentist, may be a revelation to another. Because one person is familiar with a condition or a procedure is no proof that it is universally known among dentists.

On this subject an editorial in JAMA¹ says: "sound clinical impression comes in large part from observation, one of the principal sources of knowledge. There are only two others: experimentation and reasoning. Clinical impression is often derived from the first of these alone, and unfortunately sometimes from less. Lacking as we do perfect memories, the fruits of the great sources of knowledge quickly spoil unless they are preserved, so in the growth of knowledge, recording (the notebook and pencil) takes rank as a principal aid to the advance of learning. Careful recording emerges as the indispensable preservative and protector of accurate clinical impression. Information, however derived, requires a record if it is to live, a notebook and pencil, so to speak. These simple tools are a neglected instrument. Some fields require abstruse recording devices; the clinician is lucky in that his chief need is a notebook and pencil. It is a pity he sometimes uses them so little."

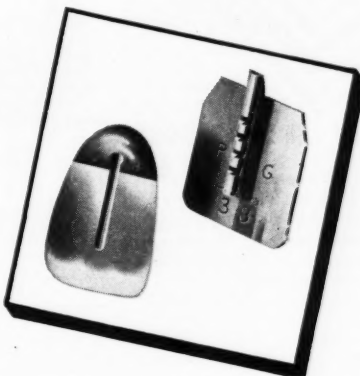
It would be simple discipline for all of us to make more records of the things that we see in practice and the deductions that we make from what we see. This kind of clinical investigation, with notebook and pencil, has real merit.

¹Editorials and Comments, JAMA 151:44 (Jan. 3) 1953.

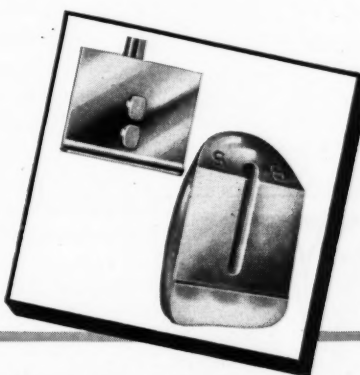
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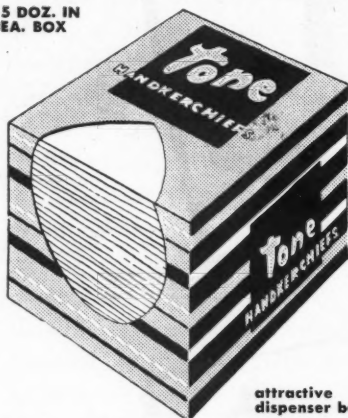
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M E D I C I N E

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Status of Vagotomy

Vagotomy is being advocated quite frequently these days for peptic ulcer. Final evaluation cannot be given until two questions are answered: (1) What proportion of patients operated on continue to have unpleasant symptoms or have a recurrence of ulcer symptoms after a number of years. (2) Whether the marked decrease in gastric secretory capacity and motility found in the early postoperative period is permanent.

No significant change in the gastric secretory or motor activity is present in patients with normal vagus function following surgery. Reduction in the motility and in both spontaneous and stimulated acid secretion of the stomach is demonstrated in patients with partial vagus function and those with no vagus function three to four years after vagotomy. No evidence of any return of gastric activity is present in this group.

A slight return of acidity is found in patients with partial vagus function

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 122 and 123)

Form to be Used by Contributors
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Evanston, Illinois

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Sketch:

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as determined by the basal secretion. However, in spite of this, there is still a marked decrease in comparison with the preoperative level.

The response of patients with partial vagus function to insulin hypoglycemia is delayed and may be undetected unless observation is continued for at least two and a half hours after the injection of insulin. Spontaneous secretion of free hydrochloric acid during the night or basal secretion indicates vagus function. In addition, vagal type motility, either spontaneous or subsequent to hypoglycemia, indicates vagus function. Decrease in gastric motor and secretory activity following vagotomy in

patients with partial vagus function and no vagus function remains three to four years after vagotomy.

Stein, I. F., and Meyer, K. A.: *Studies on Vagotomy in Treatment of Peptic Ulcer, Surg. Gynec. & Obst.* 93:625-636 (November) 1951.



Sunglasses

Military situations demand a high degree of visual efficiency for night lookout and sentry duty. One of the factors receiving considerable atten-

tion is retinal sensitivity. It has been learned that exposure to excessive sunlight seriously decreases night vision.

The following conclusions have been quite well established: (1) Wearing sunglasses of commercial density (35 to 50 per cent) will protect retinal sensitivity for short periods (one day or less) but not for a period of a week or more. (2) Wearing darker glasses will provide protection from exposure to excessive sunlight for as long as a week or more. (Such glasses are commercially available but are in the minority.) (3) Failure to wear sunglasses will reduce retinal sensitivity by an average of about 50 per cent; in extreme cases the loss can amount to more than 90 per cent. (4) Loss of retinal sensitivity can be assessed as a reduction of the effectiveness of available ambient photopic (cone) illumination. (5) Extraviscous rays (ultraviolet and infrared) cannot be considered the cause of loss of retinal sensitivity. The visible portion of solar radiation is responsible.

The loss of retinal sensitivity after exposure without sunglasses can be a causative factor of industrial and automobile accidents. Night driving after a day at the beach can be dangerous.

It is difficult to obtain sufficiently dark sunglasses. As a general rule, if the wearer's eyes can be seen behind the lenses, the lenses are probably not dark enough.

Peckham, R. H., and Harley, R. D.: *Effect of Sunglasses in Protecting Retinal Sensitivity, Am. J. Ophth.* 34:1499-1508 (November) 1951.

Your colleagues obtain results more quickly

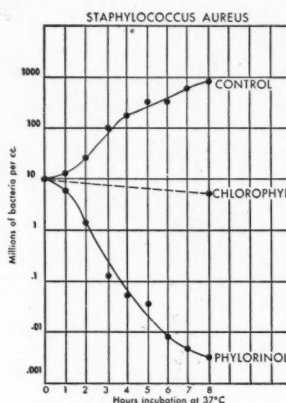
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Anemia in Pregnancy

Iron deficiency is the major cause of anemia in pregnancy. Anemia is quite common during pregnancy. Some reports state that about half of the pregnant women are anemic according to commonly accepted standards. The anemia is usually present at the onset of gestation but

may develop during the pregnancy. During pregnancy, plasma volume progressively increases. The rapid change may disguise or exaggerate the response to iron therapy if only usual blood counts are used for interpretation. The peak increase, of about 50 per cent, occurs between the thirty-second to thirty-eighth week.

Although lagging behind the plasma volume increase, total hemoglobin mass also rises progressively during apparently normal pregnancy. It reaches a maximum at term with an average increase of 15 per cent. Supplementary iron increases the rise. Whether iron is given or not, the total hemoglobin mass returns to normal by the eighth week post partum.

The term "apparent anemia" may be used to describe patients in whom hypervolemia disguises the normal increase in total hemoglobin mass. For most patients a hemoglobin level of less than 11 grams per cent after the twenty-eighth week of pregnancy indicates true anemia.

Nearly all patients who have iron deficiency anemia can be adequately treated by oral ferrous sulfate. If the anemia is noted during the first or second trimester, active treatment with iron will not only restore the hemoglobin but will produce the usual increase in total hemoglobin. In such cases treatment may be stopped at delivery.

If the anemia is discovered during the last trimester full response is not usually obtained before delivery. Dosage should be continued for six weeks at least post partum.

Lund, Curtis J.: *Studies of the Iron Deficiency Anemia of Pregnancy*, *Am. J. Obst. & Gynec.* 62:947-963 (September) 1951.

Needle Biopsy of the Liver

Information about the liver that cannot be obtained with any other method can be obtained by needle biopsy. The chief reasons for the use of needle biopsy are (1) to determine

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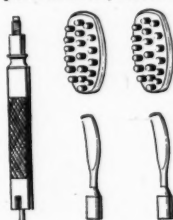


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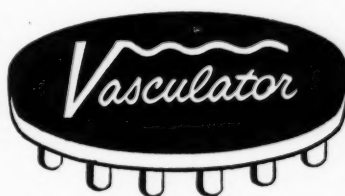


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the cause of liver enlargement, (2) to establish the cause of jaundice, (3) to distinguish between malignant disease and cirrhosis of the liver, (4) to determine when hepatitis has subsided, and (5) to evaluate the results of treatment.

It has been shown that when the biopsy diagnosis could be compared with observations at operation or autopsy, a correct biopsy diagnosis was made in 85 per cent of the cases. Repeated biopsies provide greater degree of accuracy. The biopsy is an

excellent adjunct to verify the advisability of surgical treatment.

There are a few contraindications to needle biopsy of the liver. These are: (1) an uncooperative patient, (2) impairment of the blood-clotting mechanism, (3) recent infection in the region of the biopsy, (4) ascites (which should be removed prior to biopsy), (5) abdominal distention, (6) chronic passive congestion of the liver, and (7) complete obstructive jaundice.

Needle biopsy of the liver is not

without some risk. Fatal hemorrhage has been reported as a result of needle biopsy. Twenty-five per cent of the patients complain of pain radiating to the shoulder. Thirty per cent complain of epigastric discomfort, and about 2 per cent experience pneumothorax. Occasionally other minor complications may be noted.

Needle Biopsy of the Liver: General Considerations, California Med. 76: 16-20 (January) 1952.



New Prescription Regulations

New federal regulations embodied in the Durham-Humphrey amendment to the Federal Food and Drug Act

Molle, W. E., and Kaplan, L.:

are of importance to medical and dental men. The regulations prohibit a pharmacist from refilling a prescription unless (1) the prescription calls for a simple household remedy, (2) the doctor has stated on the original prescription that refill is permitted, or (3) the pharmacist telephones or writes the doctor and obtains authorization for the refill.

The new regulations appear to be a source of annoyance to busy doctors and pharmacists. Traditionally, a doctor tells the patient to have a prescription refilled. Now, however, such authorization is illegal. To refill a prescription, the pharmacist must obtain verbal or written authorization from the doctor.

Annoyance and loss of time entailed in frequent telephone calls from pharmacists can be saved by writing on the original prescription such phrases as (1) "N.R." (non repetatur), (2) repeat once, (3) repeat as often as desired, or (4) repeat for period of three months or desired period of time. Pharmacists will observe such notations.

Without specific directions for refills a pharmacist will be under constant pressure from the patient who desires more medication. The pharmacist will be forced to phone the doctor for authorization. This is a waste of time for both. It may also endanger the patient's welfare if the doctor cannot be reached and necessary medication cannot be dispensed.

Many pharmacists plan to set aside the prescriptions in which the doctor has failed to express refill desires. A double postcard will be sent the doctor. Half of the card will give the patient's name and the medication prescribed, the return half will provide notations governing refills for the doctor to check and return to the pharmacist. The returned card will then be made part of the original prescription.

Shaffer, Hugo H.: How Recent Drug Legislation Affects the Filling of Prescriptions, New York Med. 8:23-24, 36 (January) 1952.



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Varicose Veins

One of the most distressing conditions confronting the physician is varicose veins and the ulcers of the legs they often cause. Many practitioners have concerned themselves with this condition, inasmuch as varicose veins have been recognized for some time. As a result, many forms of treatment have been advocated, none of which is completely satisfactory by itself.

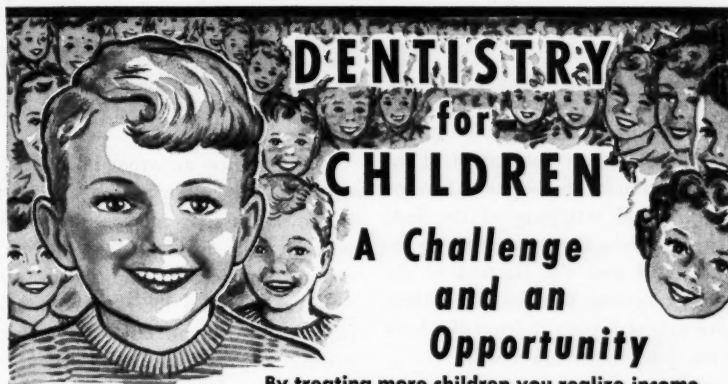
Incompetence of the valves of the veins of the lower extremities is the basic trouble in the condition. This results in retrograde flow of blood in these veins, increased pressure on the walls of the veins with a resultant dilatation and tortuosity. A vicious cycle is produced since incompetence of the valves causes increased pressure which, in turn, causes dilatation of the veins and a greater degree of incompetence of the valves. Improper nutrition of the tissues due to stasis and retrograde flow results in (1) color changes, (2) thickening of the skin, and (3) frequently ulceration.

Many theories have been advanced as to the cause of varicose veins, such as congenital absence of valves and structural defects in the vein walls. However, it is recognized today that these cannot be the only causes. Varicose veins occur most frequently in persons who are required to stand for long periods of time.

Minimal varicose veins are likely to become pronounced during pregnancy. The condition becomes progressively worse with each succeeding pregnancy. As the varicosities become more pronounced with each succeeding pregnancy the remissions do not occur and the symptoms become more severe.

The most common complaints are (1) pain, (2) leg fatigue, (3) full, bursting sensation, (4) nonulcerative skin changes, and (5) ulcers. Some patients, usually women, come for cosmetic reasons alone.

Usually the pain is aching in character and becomes worse toward the latter part of the day. Frequently there may be cramp-like pains for an hour or two after going to bed.



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It has been estimated that 244,000,000 fillings are required to restore mouth health to American children of 6 to 18... and that 33,000,000 fillings are needed each year to fill new cavities. And America's increasing birth rate will continue to increase! Caring for children is a super-human task for 80,000 dentists who serve millions of adults.

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The full bursting sensation in the legs is present in the more severe cases, particularly in persons who must stand in one position for long periods of time. The muscular action of walking helps to empty the veins so there is much less stasis even though there is marked retrograde flow. The nonulcerative skin changes vary from mild discoloration to thick brawny induration, most frequently seen in the inner aspect of the leg, but may completely encircle the leg just above the ankle.

The history should be particularly specific regarding any possible previous deep thrombophlebitis. The

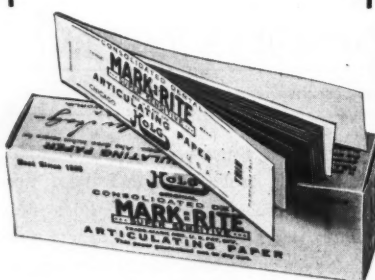
presence of a postphlebotic syndrome is usually quite apparent from the examination. It definitely does not contraindicate surgical treatment for incompetent superficial veins in which there is a retrograde flow of blood. Once there has been a major thrombophlebitis of the deep veins of the lower extremity, that extremity will never again be normal. The severity of the postphlebotic syndrome probably will become progressively worse beginning from three to five years after the original thrombophlebitis when recanalization of the organized thrombus has progressed significantly.

The most complete, the most permanent, the least traumatic, and the most easily accomplished adequate procedure for the treatment of varicose veins is the combination of the high ligation at the sapheno-femoral juncture and stripping of the long saphenous vein from the groin to the ankle; and also the ligation of the short saphenous vein in the popliteal space and stripping it from the back of the knee to the lower calf.

Doyle, R. D.: *Varicose Veins*, J. Michigan M. Soc. 51:577-580 (May) 1952.

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Reconstructive Surgery for the Elderly

Aging is first apparent in the form of conditions which are most evident in the skin among a large number of persons. The loss of skin elasticity denotes the lack of ability of the tissues to maintain their earlier optimum water content. This leads to furrowing of the skin, and later to progressive loss of muscle tone. Wrinkles appear about the eyes and mouth and there is a sagging of the face and loss of the clean-cut chin line, replaced by more or less heavy jowls.

This loss of youthful facial contour and skin quality is definitely a disturbing factor in many people, particularly among women. It is felt as an emotional burden arising out of a dislike of appearing old and as a handicap in the field of employment.

Too frequently, discrimination is exercised against a person who begins to show effects of age. This attitude is taken arbitrarily regardless of unchanged capability. Generally such discrimination takes place among persons who are occupied in public places. In some instances personal vanity makes loss of the appearance of youth intolerable.

Present day concept recognizes any physical distortion or deformity as an emotional irritant. The desirability of correction of reconstructive surgery is freely granted. If such an abnormality is due to: (1) a congenital deformity such as harelip, (2) hereditary peculiarity such as conspicuous shape of the nose or ears, or (3) developmental distortion seen as a deviating nose or markedly retreating chin, no question arises as to the demand for plastic correction. Acquired deformities following accidents, and others caused by pathologic processes, as seen in rhinophyma and new growths about the face are considered equally suitable as subjects for surgical correction.

On the contrary, changes resulting from the aging process, although sometimes equally disfiguring, are more often looked upon as unsuitable for plastic correction. There would

seem to be insufficient justification for such a positive dividing line between alterations of the skin and facial contour as a result of aging and those which are the result of heredity, disordered development, or pathologic process. From the standpoint of personality adjustment the requirements of the condition created are similar.

The important question would seem to be whether it is more ethical, as well as more desirable professionally, to include changes of the face acquired by the processing of aging as allowable to the experienced plastic surgeon, rather than to leave correction to an unaccredited operator. The continued refusal of such professional service forces this form of surgery to remain on the unethical level. It would seem more desirable to recognize such surgery as admissible from the standpoints of economic welfare and of mental hygiene.

Seltzer, Albert P.: *Reconstructive Surgery for the Elderly, Geriatrics* 7:185-188 (May-June) 1952.

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For the first time—between the covers of one book—you have *techniques in tooth extraction applicable to the whole subject*. Many monographs have been published relating to methods concerned with the extraction of a particular tooth—but there has been no book to this time describing methods of operation applicable to any and all cases likely to appear in your office.

The senior author, Dr. Frank Wendell Rounds, associated closely over a period of years with the late Dr. George B. Winter whose pioneering work in this field of dentistry not only stabilized the nomenclature, but also created Exodontia as it is practiced today.

He died while the book was in preparation and his son, Dr. Charles Elder Rounds, completed the manuscript. Both of the Rounds restricted their practice exclusively to Exodontia, and the infusion of their ideas—their experience and study—with those of one of the most prominent names in the field is a rare and exciting event in dental literature.

Throughout the book they have emphasized the "how"—not the "why" of tooth extraction and their illustrations are unusually effective. The book is a sound and valuable guide with which to estimate preoperatively the difficulties to be encountered—to standardize operative technique—or to use as an overall aid in the solution of all exodontia problems.

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Carcinoma of the Lung —Incidence

Malignant growths were found in 1,840 cases of 12,812 necropsies performed over a 35-year period at the Kansas Medical Center.

Thus, primary carcinoma of the lung occurred in 0.9 per cent of all autopsies and in 6.5 per cent of all cases of malignant growths. It is exceeded in frequency by sarcomas, intracranial tumors and carcinomas of the stomach, colon, and prostate.

There has been both an apparent and real increase in the incidence of carcinoma of the lung in recent years. The mean age in the group was 54 years with an age range from 29 to 89 years. Eighty-five per cent of the lung carcinomas occurred in men.

The growths were noted in a hilar region in 92 per cent of the patients. Distant metastases were noted in 86 per cent of the cases. Most frequently involved were the following: (1) liver, (2) adrenals, (3) brain, (4) bones, (5) heart, and (6) kidneys.

Usually cough is the predominant symptom noted first. Dyspnea, chest pains, and hemoptysis are also quite common.

The well-differentiated squamous cell growths show less tendency to metastasize than other types. The differentiated adenocarcinomas behave much as anaplastic tumors do.

Gibson, D. M.: Primary Carcinoma of the Lung; Study of 120 Autopsied Cases, Kansas M. J. 53:1-4 (January) 1952.

Headaches and Facial Pains in Lesions of Cervical Discs

HEADACHES, facial pains, anterior chest pains, and dysesthesias have been observed in patients with disorders of the cervical spine. When the well-known root symptoms are also present, the site of the pathologic process producing these phenomena is

not difficult to determine, but when they are absent, the diagnosis becomes difficult. Some patients, despairing of relief, become neurotic and resort to narcotic drugs. Acute attacks of pain may be provoked by emotional upsets, cold or heat, humidity, sudden noise, or other factors. Frequently the area behind the ear, the mastoid region, and the side of the neck are painful. One or both ears may feel "plugged"; there may also be tinnitus, clicking noises, or even vertigo.

Explanation of Pain

One author explains on the basis of the anatomic topography why root involvement in cervical disc lesions may cause preganglionic sympathetic irritation. This may produce vasomotor disturbances in certain arterial areas, with resulting headaches and craniofacial pains.

Therapy

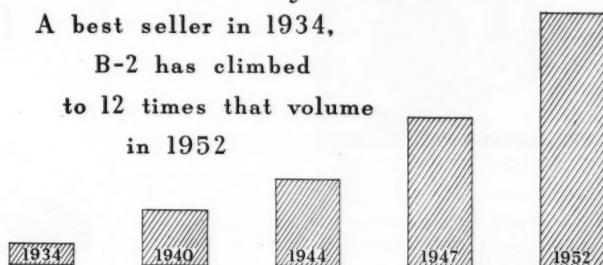
Stretching of the cervical spine by means of traction is the most effective therapeutic procedure. Vertebral traction widens the intervertebral fo-



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ramina and spaces, stretches the ligaments and joint capsules of the cervical spine, relieves muscle spasm, returns displaced discs and vertebrae to their original site, and facilitates reduction of subluxated joints. Pressure is removed from nerve roots, blood vessels and lymphatics, and pain is relieved with restoration of normal circulation. Stretching was employed in 47 patients, traction being applied by headsling to the cervical spine in a total of 742 sessions. All but seven of the patients were

either completely or partly relieved.

It is suggested that in all cases of headache or craniofacial pain of obscure origin, the cervical spine should be examined. It should be borne in mind, however, that absence of roentgenologic as well as myelographic evidence does not necessarily rule out cervical disc disease.

Adapted from Medical Literature Abstracts, *Journal of the American Medical Association* 150:1342 (Nov. 29) 1952.

Green Teeth

WHEN an Rh-negative woman marries an Rh-positive man, she may conceive an Rh-positive fetus. The fetus may stimulate her to produce anti-Rh antibodies, which pass across the placenta and attack the fetal erythrocytes. Large numbers of red cells are destroyed and the hemoglobin released is broken down into pigments, which give the baby severe jaundice. Some of those who have had severe jaundice may, if they survive, show a curious vestige of the symptom when their first teeth appear; they have green teeth. This is due to the altered blood pigment being deposited in the tooth buds. It varies from green to brown and is most frequently seen in the central incisors. About five per cent of such infants are affected in this way, but the second dentition is normal.

From Medical Literature Abstracts, *Journal of the American Medical Association* 150:1544 (Dec. 13) 1952.

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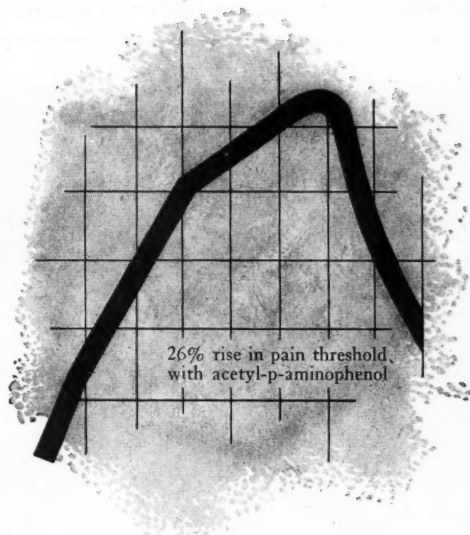


Hold That Advice!

The dentist, supreme in his own little kingdom of four walls, is sometimes inclined to pass opinions and give advice on subjects that are outside his field of experience. When he sticks to giving advice on dental subjects he is safe. When he gives suggestions and counsel on extraneous subjects he is entering an area of danger.

There is a difference between advice-giving on personal and on impersonal subjects. To tell people whom they should marry, how they should raise their children, where to go on a vacation, what they should do with their mother-in-law are explosive-packed subjects. Impersonal subjects are safer but still have a potential of danger. Telling a friend

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what kind of car he should buy and what kind of gasoline or oil he should use in it may seem innocuous but let the car collapse before 100,000 miles or the gas consumption be less than 25 miles a gallon, or the oil sludge readily, and you may expect to hear that your advice was worthless. Never expect, if things go well, to hear a word of praise for a phenomenal judgment.

I am reminded of the patients we refer for professional advice and treatment. If the oral surgeon breaks a root or has a bit of postoperative difficulty, you may expect the referred patient to tell you about it in a tone of feebly masked hostility. If the orthodontist does not make buck-toothed Bertha into a symphony of feminine allure, and if one little lateral is out of line you may expect the complaints to thunder in upon you. When you refer a patient to a physician, watch out! If the patient is not immediately restored to perfect health and vigor and the fee slightly less than the cost of a pair of shoes, open your ears for the stream of wrath.

Because the proceeds from advice-giving are so small if things go well and the abuse is so pungent if things go wrong, it is a wonder that people ever give advice. We know that seldom do we receive credit for good advice and invariably receive blame for the advice we give that is not good. How come? Why do we do it?

I suppose that many of us are incurable advice-spreaders even when we are not asked for an opinion because this oral exercise inflates our egos and allows them to ascend like balloons to Olympian heights. We feel that when we give out advice we are dispensing the wisdom of the ages and are expressing laws and testaments and credos of lasting value.

We should watch ourselves when we begin: "What you ought to do is—" When that dangerous formula of gratuitous advice-giving begins to form in our cortex, starts to vibrate in our larynx, and begins to disturb our lingual inertia—we should stop everything. If the gem of sagacity that we are about to drop has not been asked for at all, we should choke off completely "What you ought to

do is—" If someone has asked our opinion, even on a subject where we have some expert knowledge, we should restrain ourselves from the pontifical "What you ought to do is—"

A far better device than the oracular note is the evaluative statement. That consists of stating the case, indicating the method or choices involved, then suggesting a course of action. So far as dental affairs are concerned, it means telling the patient what is the matter with him,

telling him how the case may be treated and the possible choices, and then indicating the preferred method of treatment by such phrases as "in my judgment," or "from my experience," or "I would suggest." This approach removes us from the position of being all-knowing and puts us in the favorable position of allowing the patient to make the decision. On all matters of importance dealing with people who are adults and are of sound mind it is well to avoid mak-

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ing decisions for them. That goes for our patients and our families, and our friends, as well. Counsel long and patiently, yes; make decisions for them, never.

Here, from the January, 1953 issue of GP, the medical journal, is *sensible advice* on that subject from the psychiatrist, Ian Stevenson:

"The patient should be encouraged to make his own decisions. Patients who need psychotherapy have usually been dominated by others, and al-

though they have resented this control, they are unable to shake it off because of their excessive dependency. If now the doctor makes decisions for them, they may outwardly acquiesce and even appear grateful, but the original state of resentful dependence persists.

"A further reason for not giving direct advice is the difficulty, perhaps the impossibility of deciding on a course of action which will be appropriate to the patient's individual

needs and abilities. The doctor who permits himself to give advice will be tempted to advise what he has found helpful for himself, which may or may not help the patient.

"In particular, advice encouraging specific major changes such as marriage, divorce, change of job, pregnancy, etc., should be avoided. There may be a few occasions where inhibiting advice from the doctor is helpful. Thus if the patient exclaims that he is going off to get a divorce or resign from his job, the doctor may offer a word of caution such as: 'I wonder if you're really relaxed enough to make a good decision about this matter.'

"It is also permissible for the physician to offer advice which can be generalized, as contrasted with advice to specific actions. Many patients neglect the rules of physical and mental hygiene and need instruction therein. The test of the permissibility of a given piece of advice is whether or not it can be applied to many occasions. For example, the doctor

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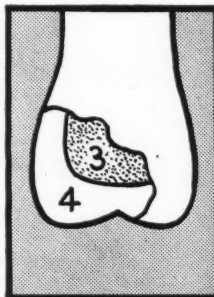
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should not advise the patient to change his job, but he may encourage him to express his feelings to the boss more than he has been doing. Similarly he may tell the patient it would be helpful for him to confide more in his wife.

"Patients frequently seek the approval of the doctor for decisions which they have made. He should give his approval if he agrees with the patient. On the other hand, if he feels that the patient's decision was unwise, he should try to avoid saying so. It is usually possible to avoid a committing statement. It is important for the patient to feel that the doctor is backing him as a person whatever he does."

Fate and Fluorides

Years ago I knew an earnest dentist in Kansas who spent his energy trying to convince the voters of his community that the fluoride in the community water supply was producing mottled teeth. That was before we knew that mottled teeth were more resistant to caries than beautiful white shiny teeth. This sincere dentist convinced the people of the community that they should dig new wells where the water was free from fluoride. A bond issue was made and the community changed from high fluoride content water to fluoride-free water. My friend did not live long enough to see the ironical results which I presume were simply these: The children in this Kansas community had prettier teeth after the new water supply but they had more tooth decay.

This Kansas dentist was not the only one who made the same honest error. The chief chemist of the great and powerful Aluminum Company of America announced on May 31, 1931 that he had found the "Secret Poison Which Blackens Teeth of Children." The last paragraph of a newspaper story of May 31, 1931 is: "Eager interest has been manifested in Churchill's [Editor's Note: Not Winston but the Aluminum Company of America chemist] discovery among health experts and dentists the world over, and it is believed that those cities whose children suffer

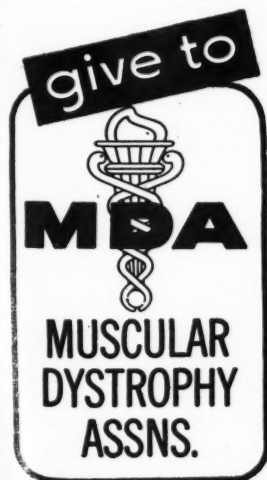
3-53

from 'mottled enamel' may have to add, to avoid it, a method of eliminating fluorine to their present water-purification methods."

Now we find that same company, the Aluminum Company of America, that was so disturbed with the mottled teeth of the children in the company-built town of Bauxite, Arkansas, is the same company that is selling fluoride products to communities to add to the water supply to prevent tooth decay. In 1931 the Aluminum Company of America was carrying on a campaign to throw fluoride out of the water supplies. Now they are carrying on a sales campaign to put fluoride into the water supply. In this statement there should be no possible implication that this great corporation is engaging in nefarious enterprise when they are selling fluoride salts to communities. The demand for this kind of water treatment has sprung primarily from the dental profession and the commercial enterprises are merely acting to fulfill those demands.

The temptation to moralize at this point is overwhelming. If, in 1931 the chief chemist of the Aluminum Company of America and his dental consultants, did not know that fluoride produces a partial immunity to tooth decay, how can we be sure that chemists today can be so certain that fluoride does not produce disastrous systemic effects? I am asking. I do not know the answer.

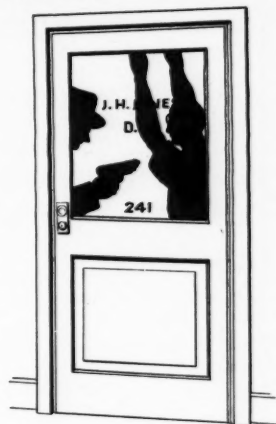
—E.J.R.



In your ORAL HYGIENE this month

BEWARE of the Collection

Bandit!



This bandit carries only a sheaf of contracts, but these innocent-looking papers can be as effective as a gun in extracting money from the unsuspecting dentist-victim. Arthur H. Labaree explains some of the devious ways in which the unethical—but legally immune—collection "agent" has defrauded many a dentist.

★ ★ ★

"Yes, a Specialist Has Problems Too," admits Doctor Louis Willinger, in answer to Doctor A. Randall Ruskin whose article appeared in the October issue. Doctor Willinger enumerates some of the hazards a specialist encounters, and explains how a more co-operative attitude on the part of the referring practitioner could save the patient both mental and physical distress.

★ ★ ★

Have you ever heard of "Business Interruption Insurance for the Dentist"? It's worth looking into. Doctor Louis H. Guernsey and Allen H. Guernsey give you the details.

★ ★ ★

"The average patient, being honest, is anxious to know in advance the total involved (in proposed dental treatment) to make possible the allocation and budgeting of funds"—yet how can a dentist give an estimate that will prove to be fair to both patient and practitioner? Doctor David Tabak, in his article, "This Will Be Extra," discusses the involved subject of dental contracting.

★ ★ ★

Would you like to invest your money in common stocks without investing your time and effort in study

of the market? You can—by using the "mutual funds" plan. This plan is explained in the article, "The Professional Man and His Money," by Sidney Scott Ross.

★ ★ ★

There's a new School of Dentistry at the University of Southern California. Two full pages of photographs give a dentist-eye view of the facilities of this modern, well-planned school.

★ ★ ★

"Business Property Pays Good Dividends," says John Y. Beaty, editor of *Investor's Future*. His article discusses several types of property in which the dentist might profitably invest.

★ ★ ★

Perhaps you'll be interested in some figures we've compiled. If you've been reading *Oral Hygiene* during the past year, you've read: 6 articles on the dentist's personality and health; 5 on his savings and investments; 8 on his retirement and family security; 12 on practice policy and management; 11 on income, fees, and collections; 12 on patient relations; 4 on the dentist's vulnerability to malpractice charges; 8 on the dentist's civil and military responsibilities. That's quite a list, but it doesn't include nearly all of the material that came to you in *Oral Hygiene*. There were many other articles—and a dozen editorials—on various subjects, and all of the regular monthly departments and features. If you've been reading *Oral Hygiene*, you've stowed away a lot of information and received (we hope) some very practical help in solving the personal problems of your professional life.

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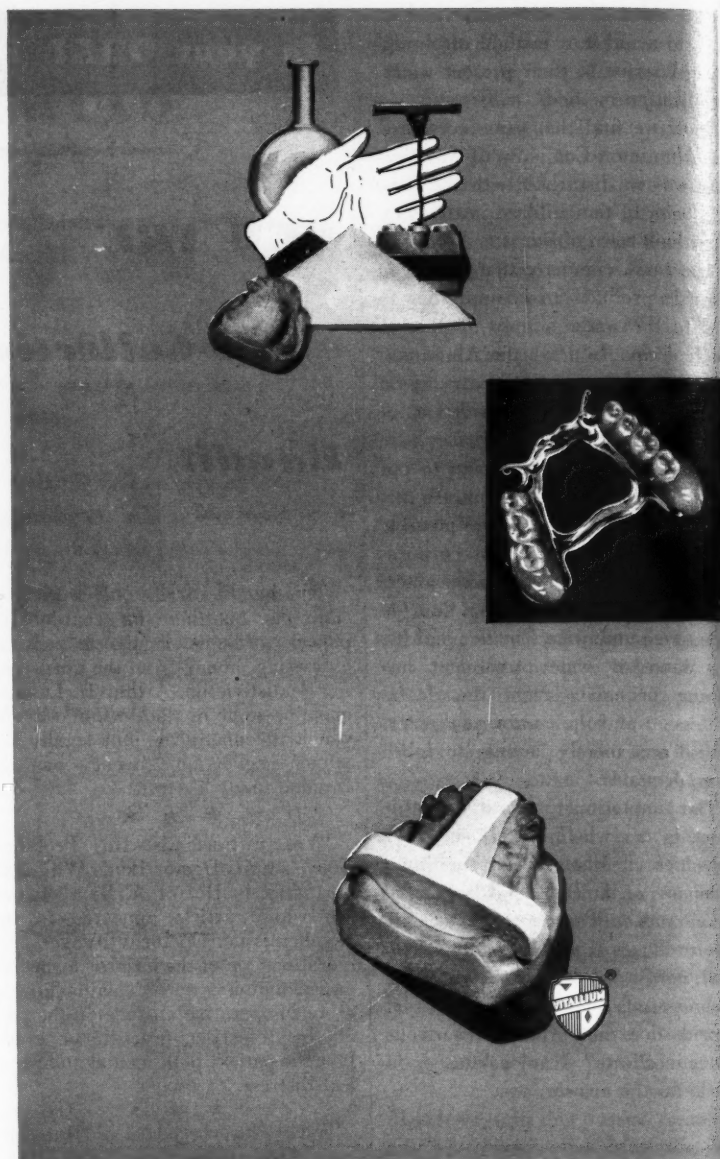
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